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**BEFORE THE
SURFACE TRANSPORTATION BOARD**

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RAILROAD COST OF
CAPITAL — 2018

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) EX PARTE NO. 558 (Sub- No. 22)
)

**COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS
AND ITS MEMBER RAILROADS**

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April 22, 2019

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Verified Statements

Witness*	Subject
John T. Gray	The railroads' market value capital structure, overall cost of capital, cost of common and preferred equity, and cost of all types of debt.

*Verified statements are referenced in these comments by witness name – viz., V.S. Gray at _____

**BEFORE THE
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RAILROAD COST OF
CAPITAL — 2018

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) STB Docket No. EP 558 (Sub-No. 22)
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**COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS
AND ITS MEMBER RAILROADS**

By a decision served on February 15, 2019, the Surface Transportation Board (“STB” or “Board”) instituted this proceeding to determine the railroad industry’s cost of capital for the year 2018. The Board noted that this determination will enable it to make the statutorily required annual individual railroad revenue adequacy determination for 2018. 49 U.S.C. § 10701(d)(2), § 10704(a)(2). The Board noted further that the cost of capital determination may also be used in various other STB railroad proceedings. *See Railroad Cost of Capital – 2018*, EP 558 (Sub-No. 22) (STB served Feb. 15, 2019).

The railroads, through the Association of American Railroads (“AAR”), are submitting their calculation of: (1) the railroads’ 2018 cost of common equity capital; (2) the railroads’ 2018 current cost of preferred equity capital; (3) the railroads’ current 2018 cost of debt capital; and (4) the 2018 capital structure mix of the railroad industry on a market value basis.

The AAR’s calculations are discussed in the attached verified statement of John T. Gray, Senior Vice President, Policy and Economics of the AAR. Mr. Gray’s statement establishes the following:

1. The 2018 cost of common equity capital is 13.86 percent.

2. The 2018 cost of preferred equity capital is 3.70 percent.
3. The 2018 cost of debt capital is 4.16 percent.
4. The capital structure of the railroad industry is 16.92 percent debt, 0.00 percent preferred equity,¹ and 83.08 percent common equity.

From these data, Mr. Gray concludes that the overall railroad industry cost of capital for 2018 is 12.22 percent.²

I. Introduction

The sole purpose of this proceeding is to determine the railroad industry's cost of capital for 2018. The cost of capital will be computed using the current cost of debt and equity and market value weights. *See Standards for Railroad Revenue Adequacy*, 3 I.C.C.2d 261 (1986), *aff'd sub nom., Consolidated Rail Corporation v. United States*, 855 F.2d 78 (3rd Cir. 1988). The Board has adopted a composite railroad approach to computing an industry-wide cost of capital. This approach relies upon data from a sample of railroads meeting criteria established by the Board and its predecessor, the Interstate Commerce Commission, in Ex Parte No. 458, *Railroad Cost of Capital — 1984*, 1 I.C.C. 2d 989, 1003–04 (1985), and *Revisions to the Cost-of-Capital Composite Railroad Criteria*, EP 664 (Sub-No. 3) (STB served Oct. 25, 2017). Those criteria are: (1) the company is a Class I line-haul railroad; (2) if the Class I railroad is controlled by another company, the controlling company is primarily a railroad company (at least 50 percent of its total assets are devoted to railroad operations), and it is not already included in the study frame; (3) the company's bonds are rated at least BBB by Standard & Poor's and Baa

¹ The weight for preferred equity is small enough that it rounds to 0.00.

² Gray V.S. at 2, 58.

by Moody's; (4) the company's stock is listed on either the New York Stock Exchange or the NASDAQ; and (5) the company has paid dividends throughout the year (2018).³

This year there are four railroad corporations or holding companies in the sample meeting the Board's criteria: CSX Corporation, Kansas City Southern, Norfolk Southern Corporation, and Union Pacific Corporation. These railroad companies are the same four companies included in the 2017 sample.

II. The Cost of Common Equity Capital

In its February 15, 2019, order instituting this proceeding, the Board directed that the cost of capital components be calculated "using the methodology followed in Railroad Cost of Capital – 2017." See *Railroad Cost of Capital – 2018*, EP 558 (Sub-No. 22), slip op. at 2 (STB served Feb. 15, 2018). In *Railroad Cost of Capital – 2017*, the Board calculated the cost of equity component in its annual cost of capital proceeding using a simple average of the estimates produced by the Capital Asset Pricing Model (CAPM) adopted in *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, EP 664 (STB served Jan. 17, 2008) and the Morningstar/Ibbotson Multi-Stage Discounted Cash Flow Model (MSDCF) adopted in *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub-No. 1) (STB served Jan. 28, 2009).⁴ See *Railroad Cost of Capital – 2017*, EP 558 (Sub-No. 21), slip op. at 6-13 (STB served Dec. 6, 2018).⁵ Mr. Gray used a simple

³ Effective November 24, 2017, the Board modified the fourth screening criterion to require a company's stock to be listed on either the NYSE or NASDAQ.

⁴ The Morningstar/Ibbotson MSDCF model adopted by the Board is a modified version that includes only the railroads that pass the screening criteria set forth in *Railroad Cost of Capital—1984*, 1 I.C.C. 2d 989 (1985), for inclusion in the sample of railroads used for the annual cost of capital determination. See *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub-No. 1), slip op. at 4 (STB served Jan. 28, 2009).

⁵ The Board determined that using a simple average of CAPM and the commercially accepted Morningstar/Ibbotson multi-stage DCF model to calculate the cost of equity yields a more precise

average of the CAPM and Morningstar/Ibbotson MSDCF models adopted by the Board in his calculation of the cost of common equity in this proceeding.

A. The CAPM Methodology

Under the CAPM methodology as applicable to the annual cost of capital proceeding, the cost of common equity is calculated by determining the return an investor would receive on a risk-free investment and by adding to the risk-free return a premium associated with the risk of railroad stocks. The premium is calculated by multiplying the market risk premium of the stock market as a whole by a factor, known as beta, that represents the non-diversifiable risk of holding railroad stocks. In formulaic terms, the CAPM can be expressed as:

$$K = RF + (MRP \times \text{beta})$$

Where K = the firm's cost of equity,
RF = the risk-free rate,
MRP = the market's risk premium, and
beta = coefficient of systematic, non-diversifiable risk of the stock.

Mr. Gray's attached Verified Statement explains how the AAR calculated the cost of equity using the CAPM methodology. The risk-free rate was retrieved directly from the Federal Reserve Board website as approved by the Board in earlier proceedings, including the 2017 cost of capital proceeding. *Railroad Cost of Capital – 2017*, EP 558 (Sub-No. 21), slip op. at 7. Since the 2006 cost of capital determination, the well-regarded and widely-accepted Ibbotson Equity Risk Premium has been used for the market risk premium, as found in the *Ibbotson SBB**I Valuation Yearbook* published by Morningstar.⁶ Though that publication was discontinued after

determination than relying on CAPM alone. As noted by the Board, "By using an average of the results produced by both models, we harness the strengths of both models while minimizing their respective weaknesses. The result should be a stable yet precise estimate of the cost of equity that we can use in future regulatory proceedings and to gauge the financial health of the railroad industry." *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub-No. 1), slip op. at 15 (STB served Jan. 28, 2009).

⁶ Ibbotson Associates is a wholly-owned subsidiary of Morningstar, Inc. "SBB" stands for "Stocks,

the 2013 edition, much of the same data could be found in the *Ibbotson SBBI Classic Yearbook*. Beginning in 2016, Morningstar stopped publishing its *Ibbotson SBBI Classic Yearbook*. For the 2015 cost of capital calculation, the AAR utilized the Duff & Phelps *2016 Valuation Handbook – Guide to Cost of Capital* as a source for the Ibbotson Equity Risk Premium (a.k.a. market risk premium), as this figure is calculated using the same sources and methodology as Ibbotson.⁷ Gray V.S. at 30. For the 2016 calculation, the same source was used: the Duff & Phelps *2017 Valuation Handbook – Guide to Cost of Capital*. Though that publication was discontinued in hardcover form, the publication is available through the Duff & Phelps online *Cost of Capital Navigator*. For the 2018 calculation, the same source was used (the Duff & Phelps *2018 Valuation Handbook – Guide to Cost of Capital*), but it was obtained through the online *Cost of Capital Navigator*. The calculation for beta was made using the S&P 500 Price Index and the same methodology approved by the Board in previous cost of capital proceedings, including the 2017 cost of capital proceeding. Gray V.S. at 26-38.

The values determined by Mr. Gray for the elements of the CAPM methodology were 3.02 percent for the risk-free rate, 6.91 percent for the market risk premium, and 1.1120 for beta.

Based on the four-railroad composite described above and the procedures used by the STB in the last cost of capital proceeding, Mr. Gray estimates that under the CAPM methodology the cost of common equity capital for 2018 is 10.70 percent. Gray V.S. at 38.

Bonds, Bills, and Inflation.

⁷ Duff and Phelps notes that this premium is “Calculated as the average annual return of the S&P 500 total return index minus the average annual return of the SBBI long-term (20-year) government bond income return series over the 1926-2016 time period. The long-horizon historical equity risk premium was previously published on the “back page” of the Morningstar/Ibbotson *SBBI Valuation Yearbook* (discontinued).”

B. The Morningstar/Ibbotson MSDCF Methodology

The Morningstar/ Ibbotson MSDCF methodology, as adopted by the Board, calculates the cost of common equity capital as follows:

The cost of equity in a DCF model is the discount rate that equates a firm's market value to the present value of the stream of cash flows that could affect investors. These cash flows are not presumed to be paid out to investors; instead, it is assumed investors will ultimately benefit from these cash flows through higher regular dividends, special dividends, stock buybacks, or stock price appreciation. The incorporation of these cash flows and the expected growth of earnings are the essential aspects of the multi-stage DCF we are adopting here.

The Morningstar/Ibbotson model defines cash flows (CF), for the first two stages, as income before extraordinary items (IBEI) minus capital expenditures (CAPEX) plus depreciation (DEP) and deferred taxes (DT), or

$$CF = IBEI - CAPEX + DEP + DT.$$

An average cash flow figure is used as the starting point of the analysis under the Morningstar/Ibbotson model. To find the average cash flow, the model uses the 5-year period leading up to the year being analyzed, and the total cash flows for that time period are divided by total sales, which determine the 5-year cash-flow-to-sales ratio. The ratio is then multiplied by the total sales for the year being analyzed to obtain the average cash flow estimate for that year. For the third (and final) stage of the Morningstar/Ibbotson multistage DCF model stage, Morningstar/Ibbotson uses two additional assumptions: that there is no depreciation or deferred taxes. Therefore, in the third stage, cash flows are based solely on income before extraordinary items.

Growth of earnings is also calculated in three stages. In the first stage (years 1-5), the firm's annual earnings growth rate is assumed to be the median value of the qualifying railroad's 3- to 5-year growth estimates as determined by railroad industry analysts and published by Institutional Brokers Estimate System (IBES). In the second stage (years 6-10), the growth rate is the simple average of all growth rates in stage 1. In stage three (years 11 and onwards), the growth rate is the average long-run nominal growth rate of the U.S. economy. This long-run nominal growth rate is estimated by using the historical growth in real GDP and the long-run expected inflation rate.

Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital, EP 664 (Sub-No. 1), slip. op. at 5-6 (STB served Jan. 28, 2009).

The cost of common equity capital using the Morningstar/Ibbotson MSDCF model adopted by the Board is also calculated and explained in the attached Verified Statement of Mr. Gray. Consistent with the methodology approved by the Board in *Railroad Cost of Capital – 2008*, EP 558 (Sub-No. 12), slip op. at 9-10 (STB served Sept. 25, 2009), Mr. Gray’s calculations used only IBES growth estimates (distributed by Refinitiv) available as of December 31, 2018, and stock market values were based on shares outstanding and stock prices as of the last trading day of the last full week for 2018 – December 28, 2018 (Friday). Gray V.S. at 44.⁸

Mr. Gray calculates the cost of common equity capital for 2018, using the STB’s version of the Morningstar/Ibbotson MSDCF model, as 17.01 percent. Gray V.S. at 51.

C. Conclusion as to the Cost of Common Equity Capital

Under the Board’s methodology, the cost of common equity capital is the simple average of the results using the CAPM and Morningstar/Ibbotson MSDCF models. The simple average produces a cost of common equity capital of 13.86 percent. Gray V.S. at 53.

III. **The Cost of Preferred Equity Capital**

Preferred stock is a hybrid security which has some characteristics of debt and some characteristics of equity. Its cost depends on its specific features. The methodology used by the Board applies the following criteria:

- (a) Where the preferred is not convertible into common stock, and where the corporation is not required to redeem the preferred at specific times, the cost of preferred equity is equal to its current dividend yield.

⁸ Consistent with the methodology approved by the Board in *Railroad Cost of Capital – 2017*, EP 558 (Sub-No. 21), slip op. at 11-12, Mr. Gray’s calculations used data inputs in the cash flow formula as retrieved from the railroads’ 2014 - 2018 10-K filings with the SEC (and used restated data where set forth in any subsequently filed 10-K filings with the SEC). See Gray V.S. at 42.

- (b) Where the preferred is not convertible but is subject to mandatory redemption providing holders of the instrument with a premium, the cost is equal to the current dividend yield, plus the present value of the premium.
- (c) Where the preferred is convertible at the option of the holder, and the market values of the preferred and common indicate that conversion is likely to occur or that the conversion right controls the price of the preferred, the preferred has the same cost as common equity.

From 2003 through 2012, no railroads in the composite had preferred stock outstanding. Since 2013 and continuing in 2018, one railroad in the group had preferred stock outstanding. The estimated cost of preferred equity is 3.70 percent for 2018. Gray V.S. at 57.

IV. The Cost of Debt

The cost of debt can include costs for three categories (bonds, equipment trust certificates, conditional sales agreements) of debt instruments, plus flotation costs.⁹ To determine the cost of debt for bonds, Mr. Gray has computed the average current bond yield for 125 bonds from the sample railroads for which data were available during 2018. This methodology is identical to that used in the last 28 cost of capital proceedings. *Railroad Cost of Capital – 2017*, EP 558 (Sub-No. 21), slip op. at 4. Under this approach, the bond yield is based on a sample representing 99.2 percent of the book value of the bonds issued by the railroads in the sample.¹⁰ As the Board has recognized, equipment trust certificates (ETCs) and conditional sales agreements (CSAs) are not actively traded in secondary markets. Their costs were therefore estimated by comparing them to the yields on Treasury securities that are actively

⁹ The term “bonds” is used to describe bonds, notes, debentures, and other similar types of debt.

¹⁰ Bond data were retrieved from a Bloomberg database. Gray V.S. at 8.

traded.¹¹ This is the same methodology used by the Board in the last 29 proceedings. The composite current cost of debt is the market-weighted average cost of bonds, ETCs, and CSAs (if there were any), plus a small flotation cost.¹² Using the Board's established methodology, the railroads' 2018 cost of new debt is 4.16 percent. Gray V.S. at 24.

V. The 2018 Capital Structure of the Railroad Industry and the Overall Cost of Capital

Pursuant to the Board's February 15, 2019 decision, the market values of debt, preferred equity, and common equity were compiled to compute the 2018 capital structure of the railroad industry. The railroads' market value capital structure on a market value basis is 16.92 percent debt, 83.08 percent common equity capital, and 0.00 percent preferred equity capital. Gray V.S. at 58. Based upon this capital structure, the overall 2018 cost of capital is 12.22 percent. Gray V.S. at 58.

Conclusion

The Board should determine that the railroads' cost of capital for 2018 is 12.22 percent.

Respectfully submitted,



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April 22, 2019

¹¹ Gray V.S. at 12, 16. No CSAs were modeled because none are outstanding.

¹² In this proceeding, the AAR calculated bond flotation costs by using data reported by the sample railroads to the Securities and Exchange Commission (SEC) regarding new debt offerings in 2018. This is the same methodology approved by the Board in *Railroad Cost of Capital –2017*, EP 558 (Sub-No. 21), slip op. at 6. Gray V.S. at 19-23.

CERTIFICATE OF SERVICE

I hereby certify that on this 22th day of April, 2019, I caused to be served by first class mail, postage prepaid, a copy of the forgoing on the following:

Robert D. Rosenberg
Slover & Loftus
1224 Seventeenth St, NW
Washington, DC 20036-3003



Elizabeth J. Eagney

BEFORE THE
SURFACE TRANSPORTATION BOARD

EX PARTE NO. 558 (Sub-No. 22)
RAILROAD COST OF CAPITAL — 2018

VERIFIED STATEMENT
OF
JOHN T. GRAY
SENIOR VICE PRESIDENT — POLICY AND ECONOMICS
ASSOCIATION OF AMERICAN RAILROADS

April 22, 2019

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**Verified Statement
of
John T. Gray**

I. Introduction

My name is John T. Gray. I am Senior Vice President – Policy and Economics of the Association of American Railroads (AAR), with offices at 425 Third Street, SW, Suite 1000, Washington, DC 20024. The AAR is the trade association of the Nation’s major railroads, as well as the railroads of Canada and Mexico. The AAR’s United States railroad members, which include all of the Class I railroads plus about 150 additional Class II and III freight railroads, account for approximately 97 percent of our Nation’s total railroad freight operating revenue.

When appropriate, the AAR represents the railroad industry before government bodies, including economic regulatory proceedings before the Surface Transportation Board (“STB” or “Board”). In particular, the AAR has participated in all of the STB proceedings addressing revenue adequacy standards and the annual cost of capital determinations.

Aside from other responsibilities, I have conducted or directed a wide range of analyses and projects addressing regulatory, legislative and internal issues relevant to railroads. Furthermore, I have testified before federal regulatory agencies, and have been an expert witness for a railroad. A summary of my qualifications and experience appears at the end of this statement.

In this submission, I am responding to the Board’s decision of February 14, 2019 (served February 15), instituting a proceeding to determine the railroad industry’s 2018

cost of capital — Ex Parte No. 558 (Sub-No. 22), *Railroad Cost of Capital — 2018* ("Ex Parte 558 Decision"). In my statement, I calculate the cost of debt for the railroad industry using the procedures accepted in previous STB proceedings. I also calculate the cost of common equity using a simple average of the estimates produced using the following methods: (1) the Capital Asset Pricing Model used by the Board in Ex Parte No. 558 (Sub-No. 21); and (2) the STB's version of the Morningstar/Ibbotson Multi-Stage Discounted Cash Flow Model as used by the Board in Ex Parte No. 558 (Sub-No. 21) — including the Board's deferred tax adjustment to 2017 data. In addition, I calculate a cost of preferred equity using the dividend yield method, as used in Ex Parte No. 558 (Sub-No. 21). Finally, I calculate the market value capital structure and the overall cost of capital using the procedures accepted in previous Cost of Capital proceedings. This statement presents the details for calculating the necessary components for the overall cost of capital calculation: the market value capital structure, the cost of debt, the cost of common equity capital using the Capital Asset Pricing Model and the Multi-Stage Discounted Cash Flow Model, and the cost of preferred equity capital.

I conclude that the 2018 cost of capital for the railroad industry is 12.22 percent. This estimate is based on a current cost of debt of 4.16 percent, a cost of common equity capital of 13.86 percent; a cost of preferred equity of 3.70 percent; and market value weights for debt, common equity, and preferred equity of 16.92 percent, 83.08 percent, and 0.00 percent, respectively.

II. Determining the Cost of Capital

A. Defining the Cost of Capital

The cost of capital for a firm is the minimum rate of return on investment that the providers of capital require as a condition for making an investment in the firm. In essence, it is the threshold rate of return that makes investment in the firm attractive. The cost of capital necessarily incorporates long-term investor expectations for a company's performance. Investment funds flow to companies where the expected returns, over the investors' investment horizons, are thought to at least equal the expected returns available from other investment opportunities, giving consideration to the relative (or commensurate) risk of investment. Similarly within a company, limited capital resources flow to projects where the expected returns are anticipated to be highest, giving consideration to the relative (or commensurate) risk, uncertainty and timing of investment. Methods used to estimate the cost of capital therefore attempt to measure investor expectations. Such models of future behavior are inherently uncertain, and cost of capital computations provide only an estimate of an expected value of the cost of invested capital at a particular point in time. For some types of capital, such as traded bonds, investor expectations can be readily observed. For other types of capital, such as common equity, modeling is necessary.

B. The Composite Railroad Approach

The STB has adopted a composite railroad approach to computing an industry-wide cost of capital. This approach relies upon data from a sample of railroads meeting criteria established by the Board's predecessor, the Interstate Commerce Commission, in Ex Parte No. 458, *Railroad Cost of Capital — 1984*, 1 I.C.C. 2d 989, 1003–1004 (1985), and modified by the STB in Ex Parte No. 664 (Sub-No. 3) served October 25, 2017.

C. Selection of Railroads for Analysis

Under the criteria established by the Board for individual firm inclusion in the composite railroad sample, a company must meet certain criteria. (Ex Parte 558 Sub-No. 22 Decision) Those criteria are:

- The company is a Class I line-haul railroad.
- If the Class I railroad is controlled by another company, the controlling company is primarily a railroad company (at least 50 percent of its total assets are devoted to railroad operations), and it is not already included in the study frame.
- The company's bonds are rated at least BBB by Standard & Poor's and Baa by Moody's.
- The company's stock is listed on either the NYSE or the NASDAQ.
- The company has paid dividends throughout the year (2018).

Table 1 lists the AAR's evaluation of railroad companies that may meet the STB's criteria.

Table No. 1
Evaluation of Class I Railroads
Under Surface Transportation Board Selection Criteria
2018

Class I Railroad	Parent	Stock Symbol	Dividends Throughout 2018	Rail Assets Account For At Least 50% of Parent	Adequate Debt Rating	NYSE or NASDAQ
BNSF	Berkshire Hathaway	BRK-A	No	No	Yes	Yes
CSX	CSX Corporation	CSX	Yes	Yes	Yes	Yes
CNGT*	Canadian National Railway Co.	CNI	---	Non-U.S. company	---	
KCS	Kansas City Southern	KSU	Yes	Yes	Yes	Yes
NS	Norfolk Southern Corporation	NSC	Yes	Yes	Yes	Yes
CPSL*	Canadian Pacific Railway Ltd.	CP	---	Non-U.S. company	---	
UP	Union Pacific Corporation	UNP	Yes	Yes	Yes	Yes

* CNGT is Grand Trunk Corporation, and consists of almost all of the U.S. railroad operations of Canadian National Railway (a.k.a. CN). CPSL is Soo Line Corporation, and consists of the U.S. operations of Canadian Pacific (CP). Following STB precedent, CN and Canadian Pacific were not included in the sample because both CN and Canadian Pacific are Canadian corporations – and the cost of capital proceeding is concerned with determining costs for U.S. railroads under STB jurisdiction.

This year there are four railroad corporations or holding companies in the sample meeting the Board's criteria: CSX Corporation, Kansas City Southern, Norfolk Southern Corporation, and Union Pacific Corporation. These are the same railroad companies included in the 2017 sample. Consistent with past proceedings, the two Canadian-owned railroads have been excluded from the sample.¹ Berkshire Hathaway, owner of BNSF Railway Company, did not pay dividends throughout 2018, and the railroad is less than 50% of the company's assets.² Based on data from Annual Report Form R-1 for 2018, the four-firm composite accounts for 63 percent of the operating revenues and 59 percent of the assets of all Class I railroads.

D. Types of Railroad Capital

The total capital of a firm may include various forms of debt and two types of equity; common stock and preferred stock. Each of these three sources of capital has different expected rates of return (reflecting different levels of perceived risk of the particular debt or equity instrument), and the overall cost of capital is calculated as the market value weighted average of the costs of common equity, preferred equity, and debt. Different approaches are used to estimate the costs of each of the types of capital. In this statement, 98 percent of the cost of debt is calculated using bonds and similar instruments (including notes and debentures). The

¹ See STB Ex Parte No. 558, decided July 2, 1997, page 2, and verified statement of Craig F. Rockey on behalf of the Association of American Railroads in Ex Parte No. 558, submitted March 19, 1997, Table 1 on page 6. Accounting methods, differences in the treatment of taxes, and currency conversion could also be issues if foreign companies were added to the composite railroad. The railroad parents (CN and Canadian Pacific) are still more Canadian than USA. Comparing operating revenues for 2017 as reported in the AAR's *Railroad Facts* book, 2018 edition: CNGT was 32 percent of CN, and SOO was 29 percent of Canadian Pacific.

² The rail operations of BNSF Railway Company are the principal operating subsidiary of Burlington Northern Santa Fe, LLC – which is a subsidiary of Berkshire Hathaway, Inc. For 2018, BNSF accounted 12.0 percent of Berkshire Hathaway assets. Among the many other diverse subsidiaries of Berkshire Hathaway are GEICO, Fruit of the Loom, Helzberg Diamonds and Dairy Queen. The company also owns pipelines, manufacturers, numerous automobile dealerships, real estate companies, and newspapers.

remaining 2 percent – in the form of Equipment Trust Certificates – is calculated with a long-used model that permits comparison of market-determined yields for government debt, and the historical relationship between government debt and the type of railroad debt modeled.³ No Conditional Sales Agreements were used to calculate the 2018 cost of debt because they have all been retired. The estimate of the cost of common equity is a simple average of the results from two estimation methods. One method is calculated using the backward-looking Capital Asset Pricing Model (CAPM) following the methodology prescribed by the Board in the 2017 Cost of Capital decision. The other method is calculated using the somewhat more forward looking Multi-Stage Discounted Cash Flow model (MSDCF) methodology prescribed by the Board in the 2017 Cost of Capital Decision. The cost of preferred equity capital has been calculated using a simple dividend yield method, as used in the 2017 Cost of Capital Decision. Calculations for all three types of capital are based on data through 2018. The industry’s overall cost of capital is computed as a weighted average of the three costs — debt, common equity, and preferred equity — based upon the market value for each type of capital.

III. Debt Capital in 2018

The current cost of debt is determined from the current market-determined yields on all debt outstanding. This approach is necessary, and in past Board Cost of Capital decisions has been accepted as appropriate, because of the reasons listed below.⁴

³ There are currently four Equipment Trust Certificates modeled.

⁴ See Ex Parte Nos. 415, 436, 452, 458, 464, 466, 473, 478, 486, 491, 506, 513, 518, 523, 523 (Sub-No. 1), 588, and 588 (Sub-No. 1) through (Sub-No. 21).

- (1) There is a lack of sufficient new issues from which to develop a representative, and statistically reliable, current cost.
- (2) The stated rate of interest/dividend payment to the investor is not always the same as the cost to the railroad. For example, when securities are issued, the total amount paid by investors is seldom received by the railroad. Administrative fees, such as compensation paid to investment bankers, reduce the proceeds to the railroad. The effect of this is to increase the cost of the securities to the railroad.
- (3) The maturity mix and the type of instrument (equipment trust certificates, conditional sales agreements, long-term debt) of new security issues may be different from the average of existing securities. Because of the effect that length of maturity and type of security has on its current cost, the use of only new issues would not accurately measure the current cost.
- (4) The quantity and quality of existing debt has an impact on the yield of new issues.

A. Bonds, Notes and Debentures

As in previous Cost of Capital determinations, calculations relating to the bond market value use market data for the composite railroad whenever possible, and calculations for the cost of bond debt rely entirely on market data.⁵ Multiple sources for market data are available, and each source has its own criteria for including a financial instrument in its database. However, no market data will be available in any database for bonds that do not trade.⁶ For 2018, yields and prices of the sample railroads' bonds, notes

⁵ The terms "bonds" and "bonds, notes, and debentures" are used interchangeably herein.

⁶ In some cases, a comparable bond method could be used, where yields for traded bonds could be used for non-traded bonds with similar qualities (maturity date and type of instrument), enabling the calculation of a

and debentures were obtained from Bloomberg.⁷ This source is the same data source used since the 2011 cost of capital determination. We were able to find data for 124 unique CUSIPs (bond identifiers).⁸ Appendix A lists market value data for 125 bonds because one set of notes was issued twice during the year, and the portions needed to be split for prorating purposes.⁹ The 125 bonds represent 99.2 percent of the book value of all railroad bonds belonging to the composite railroad.¹⁰ The bonds not included in the market value calculation are those that are either not in Bloomberg's database, or were in the database but did not trade.

1. Market Value of Bonds, Notes, and Debentures

The average market value for traded bonds, notes, and debentures is calculated using the methodology employed in previous Cost of Capital proceedings. For each of 125 bonds with market data in 2018, an average price is calculated based on the simple average of monthly prices. The prices represent what the investor is willing to pay for the bond given its coupon rate and maturity date. The market value is the average market price (stated as a price per hundred dollars of principal) times the amount of debt outstanding as

probable market price. Another approach would be to construct a yield curve for a railroad. We have not recommended these approaches because the supply of bonds with market data is adequate.

⁷ Bloomberg's product is called Bloomberg Professional, and it is available as a subscription service. <https://www.bloomberg.com/professional/>

⁸ A CUSIP number is a 9-character identification code used to identify a security. CUSIP is an abbreviation for Committee on Uniform Securities Identification Procedures.

⁹ In one case, a portion of a series of notes was issued in late July after the original February issue. The two portions were kept separate to enable both portions to be correctly prorated for the year and therefore follow STB procedure. Thus, Appendix A has 125 "bonds" and 124 unique CUSIPs. See bond 69 and 70 in Appendix A, and page 2 of Appendix E.

¹⁰ In some cases, similar series of bonds have been assigned two CUSIPs because a privately-placed portion trades *among* qualified institutional buyers instead of *through an exchange*. This can also happen in a bond exchange offer where not all of the "old" bonds have been redeemed for the new version.

of December 31, 2018.¹¹ Where market prices are not available (i.e., for instruments that did not trade or were not found in the Bloomberg database), the “face value” of the bond is assumed to be the price investors would pay. This assumption may slightly overstate the market value of some issues and understate the value of others, depending upon the relationship of the instruments’ coupon rate and the current market rate. However, this possible variation is not likely to significantly affect the overall estimate of the cost of debt capital, since the differences are likely to be both small and offsetting – and, most importantly, since 99.2 percent of the book value of bonds is priced at market. Table 2 summarizes the results of the market value calculations for 2018. The market value for bonds, notes, and debentures that traded is \$43.27 billion, which is 99.2 percent of the total market value of \$43.62 billion.¹²

Table No. 2
Bonds, Notes and Debentures
Average Market Value

Railroad Co.	Traded Value (\$000)	Non-Traded Value (\$000)	Total Value (\$000)	Weight Based on Traded
CSX	\$13,848,244	\$254,338	\$14,102,582	32.00 %
KSU	\$2,411,988	\$89,613	2,501,600	5.58
NSC	\$10,257,206	\$0	10,257,206	23.70
UNP	\$16,757,492	\$0	16,757,492	38.72
Total	\$43,274,930	\$343,951	\$43,618,880	100.00 %
* The traded weight for KSU, 5.573638%, was rounded up instead of down to force the total to be exactly 100.00%.				
Prior Year	\$37,980,454	\$506,173	\$38,486,628	
Change	13.9%	-32.0%	13.3%	

¹¹ Securities that were newly issued during the year were prorated by the ratio of the number of months outstanding (rounded to the nearest half month) to the twelve-month year, as done in past proceedings.

¹² The market value and book value percentages for traded bonds rounded to the same number.

Total market value for bonds is up 13.3 percent from the previous year. Among the causes of this increase are new debt offerings outpacing retirements, as year-end book values of bonds are higher for all four railroads.

Appendix A lists details for each of the 125 bonds, notes, and debentures belonging to the composite railroad that have trading data available for 2018 in the Bloomberg database. As footnoted earlier, there are a few cases where a similar series of bonds has been assigned two CUSIPs because a privately-placed portion trades among qualified institutional buyers instead of through an exchange, as allowed under the Securities and Exchange Commission's Rule 144A. There is also one case where a series was split for prorating purposes. All instruments are summarized for each sample railroad in the front of the Appendix. Book values for non-traded debt are also listed.

2. Current Cost of Bonds, Notes, and Debentures

Table 3 summarizes the yield or cost of each railroad's debt (bonds, notes, and debentures), which, when weighted by the market value of the traded debt (as shown in Table 3), determines the sample composite cost of bonds, notes and debentures. The weighted average is 4.095 percent, which is over half a percentage point (0.585) higher than 2017's figure of 3.510 percent.

Table No. 3
Bonds, Notes and Debentures
Weighted Current Cost

Railroad Co.	Weight	Current Cost
CSX	32.00 %	4.222 %
KSU	5.58	4.260
NSC	23.70	4.105
UNP	38.72	3.960
Total	100.00 %	4.095 %

As noted earlier, the current cost for bonds, notes, and debentures is based on traded instruments issued by the sample railroads. Appendix A contains the average yield for each of the 125 securities that traded according to Bloomberg's database. The average yield for each security is a simple average of the twelve month-end yields. The traded portion of Appendix A (in the front section) summarizes the yield, or cost of each railroad's debt, which, when weighted by the market value of the traded debt, determines the sample composite cost of bonds, notes and debentures of 4.095 percent. The weights used in Table 3, as derived from the calculations in Table 2, are also based on the traded portion of bonds, notes and debentures listed in Appendix A.

B. Equipment Trust Certificates

Equipment Trust Certificates (ETCs) are debt obligations that are secured by the particular equipment which is acquired with the instrument's proceeds. In the event of default, creditors may repossess and resell or lease the equipment to pay off the debt obligations. This type of security has declined in popularity. In the 1990 cost of capital determination, ETCs accounted for 17.70 percent of the market value for the sum of bonds, ETCs, and conditional sales agreements.¹³ For 2018, this percentage is 2.15 percent. Because entire ETCs are not actively traded in secondary markets, it is necessary to determine their cost by examining the return on other debt securities that are actively traded.

An ETC is generally serially issued. As such, each year during its life an equal amount (typically 1/15th) of the original amount must be retired. Consequently, an ETC

¹³ See Table 1 in ICC Ex Parte No. 491, decided June 12, 1991. Conditional Sales Agreements accounted for an additional 2.46 percent of debt in the market value calculation.

may be thought of as a series of individual, annually-retiring bonds. In fact, when ETCs are issued, each of the maturities is sold independently from the others. A serially issued debt instrument provides an investor with the ability to purchase only those maturities of particular interest. To correctly compute the composite yield on a serially issued bond, the internal rate of return on the bond's principal and interest payments must be calculated.

To compare ETCs to other debt instruments, the yields to maturity (as detailed in Appendix B) for government bills, notes, and bonds having the same range of maturities as current ETCs were obtained from Federal Reserve data. The yield curve for these government securities (also in Appendix B) shows the relationship between the current costs, or yields to maturity, and maturity dates for government bonds (which, unlike ETCs, are actively traded in secondary markets).

These yield data have been adjusted by the Federal Reserve Board to reflect constant maturities, such that the data accurately reflect the 2018 relationships between yields and maturities. After determining the yields to maturity for government bonds of maturities similar to those of an ETC, those yields are adjusted to reflect the risk associated with the ETCs as compared to government bonds. This adjustment is the risk premium for railroad ETCs, which is the spread between ETCs and government securities.

In 2014, 2015, and 2016, a railroad issued new ETCs with interest rate spreads above government bonds of 76, 44, and 70 basis points, respectively. Since there were no new ETCs issued in 2017 or 2018, the 70 basis point spread is our most recent calculation, and I have used that difference for 2018. For comparisons, Table 4 lists historical spreads

used since 2000 and the spread proposed for 2018.¹⁴ Other than the spread for 2015, which appears to be an anomaly, the spread of 70 basis points is the lowest spread used in this century.

Table No. 4
History of Premiums for
Equipment Trust Certificates (ETC)

Data Year	Proceeding	Basis Points
2000	Ex Parte No. 558 (Sub-No. 4)	171
2001	Ex Parte No. 558 (Sub-No. 5)	114
2002	Ex Parte No. 558 (Sub-No. 6)	114
2003	Ex Parte No. 558 (Sub-No. 7)	114
2004	Ex Parte No. 558 (Sub-No. 8)	114
2005	Ex Parte No. 558 (Sub-No. 9)	114
2006	Ex Parte No. 558 (Sub-No. 10)	114
2007	Ex Parte No. 558 (Sub-No. 11)	125
2008	Ex Parte No. 558 (Sub-No. 12)	125
2009	Ex Parte No. 558 (Sub-No. 13)	80
2010	Ex Parte No. 558 (Sub-No. 14)	80
2011	Ex Parte No. 558 (Sub-No. 15)	80
2012	Ex Parte No. 558 (Sub-No. 16)	80
2013	Ex Parte No. 558 (Sub-No. 17)	80
2014	Ex Parte No. 558 (Sub-No. 18)	76
2015	Ex Parte No. 558 (Sub-No. 19)	44
2016	Ex Parte No. 558 (Sub-No. 20)	70
2017	Ex Parte No. 558 (Sub-No. 21)	70
2018	Proposed for EP 558 (Sub-No. 22)	70

The methodology used to determine the cost of ETC debt is the same as the method employed and approved in previous proceedings. Risk-adjusted yields provide the basis to value each ETC. Using formulae suggested by *Standard Security Calculation Methods*, the market value of each maturity comprising an ETC is determined. In effect, these formulae

¹⁴ The 70 basis point spread was calculated using the same method as that used for 2008, 2010, 2014, 2015, and 2016, and calculations were included in my work papers submitted with each of my verified statements.

make it possible to determine the price investors would pay in 2018 for the contractual interest payments and price appreciation for holding the instrument. It is the most accurate way to compute the current cost of ETCs to the firm for the defined period. Computing the internal rate of return of the ETC prices and their associated cash flow streams establish the current cost for ETCs. The weighted-average cost for all modeled Equipment Trust Certificates (now 4) is shown in Table 5.¹⁵

Table No. 5
Summary of Equipment Trust Certificates Modeled for 2018
(\$000)

Railroad	Amount Outstanding			Yield	Current Market Value	Current Interest Amount	No. ETC
	Beg.	Ending	Average				
CSX	\$0	\$0	\$0	--	\$0	\$0	0
KCS	0	0	0	--	0	0	0
NS	0	0	0	--	0	0	0
UP	1,004,840	961,565	983,203	3.593%	959,903	34,486	4
Total	\$1,004,840	\$961,565	\$983,203	3.593%	\$959,903	\$34,486	4

¹⁵ The formulae used to value these bonds are standards of the security industry. They are:

For bonds with less than six months to maturity:

$$DP = \left[\frac{100 + C/2}{1 + DY/360} \right] - \left[C/2 \frac{(180 - D)}{180} \right]$$

For bonds with six months or longer to maturity:

$$DP = \left[\frac{100}{(1 + Y/2)_{\text{EXP}}(N - 1 + D/180)} \right] + \left[\sum_{k=1}^N \frac{C/2}{(1 + Y/2)_{\text{EXP}}(K - 1 + D/180)} \right] - \left[C/2 \frac{(180 - D)}{180} \right]$$

Where: DP = Dollar price of the bond

C = Coupon rate as a percent per year

Weighing each railroad's yield (there was only one railroad) by its current market value for modeled ETCs results in a current cost of 3.593 percent. The average rate is higher than the 2.963 percent found for 2017. In this year's case, the premium used in the model is the same as last year – so a higher yield curve combined with the exclusion of one now-current ETC caused the increase. The higher yield curve for 2018 reflects the higher interest rates on government securities, as shown in Appendix B. The now-current, and therefore excluded, UPC Series I ETC had the lowest position on the yield curve in 2017 and a much shorter time to maturity compared to the other ETCs.¹⁶ Appendix C lists each ETC, and includes a market value and a current yield for those modeled. (Union Pacific is the only railroad using ETCs currently.) Appendix C also lists ETCs that were not modeled (and those current, which are not used). ETCs can fail to be modeled for two reasons: (1) the ETC instrument does not have all of the characteristics typical of an ETC; or (2) the ETC has a floating rate (instead of fixed) making its rate for a particular future year uncertain. There were no non-modeled ETCs this year. The market value of all modeled ETCs is \$959.90 million.

C. Conditional Sales Agreements

Conditional Sales Agreements (CSAs) are another form of railroad financing that is treated by investors as debt securities, because their interest obligations are essentially the

D	=	Number of days from settlement date to coupon date
Y	=	Yield to maturity as a decimal per year
EXP	=	Raise the term on the left to the power indicated by the term on the right
N	=	Whole number of coupons payable plus 13
K	=	Compute for K, values 1 to N and sum the results

¹⁶ The large differences in yield (and maturity dates) between the UPC Series I ETC and the other ETCs can be observed in the previous year's (2017) Appendix C Page 7.

same as interest obligations on ETCs. Like ETCs, CSAs are not generally traded in secondary markets. Accordingly, as in prior proceedings, their current cost can be determined from current yields on government bonds in a similar manner to ETCs, using a 1997 relationship between CSAs and ETCs to determine the yield spread over government bonds. As in other recent years, no CSAs were outstanding in 2018 – so none were modeled and none were added to Miscellaneous Debt. No CSAs have been modeled since 2010, and none have been outstanding (non-modeled or current) since 2014. There is no appendix for CSAs.

D. All Other Debt

Capital leases and miscellaneous debt, which are normally relatively small amounts outstanding, are listed as All Other Debt. To comply with past decisions of the Board, non-modeled Equipment Trust Certificates and Conditional Sales Agreements would have been listed in this category had there been any this year. Capital leases are the largest portion of the All Other Debt category.

Capital leases are contracts between two parties and as such take many forms.¹⁷ Since capital leases are not traded in the marketplace, their current cost is not directly observable. The lack of complete information with respect to leases necessitates that many assumptions be made to estimate their current cost and their values. For market value purposes, capital leases are included at book value. Given the large number of these leases and the significant differences among their terms, this is the only practical option available. Because the cost of capital calculation assigns this debt a cost based on traded or modeled

¹⁷ See generally 49 C.F.R. 1201, 2–20 for definitions.

securities (bonds, notes, debentures, ETCs and CSAs) that typically have a lower cost, the cost used for capital leases will be somewhat understated. The book value (assumed market value) of capital leases for 2018 is \$765.8 million.

Miscellaneous debt, such as floating rate loans, demand deposits, premiums/discounts, and various instruments with extremely small amounts outstanding are also excluded from the current cost computations. Miscellaneous debt is valued at negative \$692.6 million because in 2018 it consists mostly of discounts and unamortized debt issuance costs.

Capital leases and miscellaneous debt net to only \$73.2 million and there were no ETCs that were not modeled. Therefore, All Other Debt as a percent of the total market value of debt of the composite railroad is only 0.16 percent. Miscellaneous debt is lower than it was for 2017, and much of the decrease was caused by capital leases. More detail on Miscellaneous Debt can be found in the Debt Reconciliation portion of my work papers. This treatment of All Other Debt is the same approach used in the previous cost of capital proceeding.¹⁸

E. Market Value of Debt

Table 6 summarizes the total market value for each debt category. The total market value for traded and non-traded debt is \$44,652 million.

¹⁸ Non-modeled ETCs and/or CSAs would also have been included in the All Other category if there had been any.

Table No. 6
Market Value of Debt (\$000)

Type of Debt	Market Value	Percent of	
		Total	Subtotal
Bonds, Notes & Debentures	\$43,618,880	97.69 %	97.85 %
Equipment Trust Certificates	959,903	2.15	2.15
Conditional Sales Agreements	0	0.00	0.00
Subtotal	44,578,784	99.84	100.00 %
All Other Debt*	73,216	0.16	
Total	\$44,651,999	100.00 %	

* If any ETCs or CSAs are not modeled, they are included in All Other Debt.

Bonds, Notes, and Debentures (Bonds) account for 97.7 percent of the total market value. More detail can be found in Appendix D. As can be computed from that appendix, 99.2 percent of the Bonds' market value is determined by the results of trading throughout the year, while the remaining portion is based upon the book value of non-traded bonds.

Current costs can be determined for three of the four debt categories — Bonds, Equipment Trust Certificates, and Conditional Sales Agreements, had there been any. Therefore, in 2018, the weighted average cost of debt is based upon these three (of the four) debt categories (see subtotal column). The total market value of debt, used to determine the weight for debt in the overall cost of capital calculation, includes all four categories.

F. Flotation Costs for Debt Capital

The cost of issuing new debt generally has two portions. First, when new debt is issued by a negotiated offering or a competitive bid, the issuing firm pays a fee to the investment banking firm or firms handling the offer. These fees cover the banker's administrative costs in handling the sale and profits. Second, the issuer incurs expenses such as legal, accounting, and printing. Those types of expenses are quantified in the Securities and Exchange Commission's Form 424(b)(5) or 424(b)(2), as are the investment

banker's fee and other details of new debt offerings. Flotation costs generally vary by type of security. For ETCs and CSAs, the fees are extremely small, but costs increase as the administrative burden and underwriting risk increase (i.e., in order of increasing cost — ETCs and CSAs, bonds and notes, convertible bonds, and preferred stock and common stock). As discussed below, flotation costs directly reduce the gross proceeds available to the issuing firm.

An example helps to illustrate how flotation costs permanently increase the cost of debt capital to the railroad. If a railroad sells a 10-year bond with an annual coupon of 15 percent and investors are willing to pay \$98 for each \$100 in face value, the effective yield on the bond is 15.40 percent. Because the investment banker requires compensation (flotation costs) for his work, the railroad does not receive the full \$98 from the investors. In addition, the railroad will have its own internal costs such as legal and accounting. If flotation costs reduce the net proceeds to say \$96, the effective cost to the railroad over the life of the bond is 15.82 percent. Therefore, flotation costs have increased the cost of debt from 15.40 to 15.82, or by 42 basis points. Proper accounting treatment requires the \$4 per \$100 ($\$100 - \96) to be amortized on a straight line basis over the life of the bond. In addition, the Uniform System of Accounts requires the annual amortization to be charged directly to Account No. 548, Amortization of Discount on Funded Debt, a fixed charge item. This results in fixed charges for the year totaling \$15.40 (\$15.00 coupon payment + amortization of \$0.20 discount + \$0.20 flotation costs). It is important to note that these flotation costs are not recovered through operating costs but are fixed charges each year during the life of the bond. Also, it is evident that in order to reflect the total current cost of debt, flotation costs must be included.

Any firm requires the opportunity to cover flotation costs before it will have an incentive to make future capital expenditures. Before creditors will lend their funds, they must be assured that the railroad will have the opportunity to earn returns sufficient to cover all costs.

Using the same methodology used since 2008, I calculated 2018 flotation costs for bonds using publicly available data from electronic filings with the Securities and Exchange Commission (SEC).¹⁹ The filing types are “Prospectus Rule 424(b)(2)” and “Prospectus Rule 424(b)(5)”. In addition to standard bond information such as coupon and maturity date, these filings also provide the price to investors, underwriter’s fee, and railroad expenses excluding the underwriter’s fee. I have calculated a yield based on the price to investors and a yield that also included flotation costs. The difference between the two yields is the flotation cost expressed in percentage points. For 2018, 18 new issues were reported in six filings, with some filings reporting multiple new issues. This total of 18 new issues is much higher than normal. A simple average of the 18 flotation costs is 0.078 points, which is .009 higher than the figure used by the Board for 2017 – although not substantially different. As before, debt exchanges have not been included. Pages 1 through 3 of Appendix E contain a table with input data and calculations. Pages 4 and 5 of the same appendix contain, as an example, the pages from the SEC filing that were used as a source for one of the filings. The source filings for all of the new bond issues have been included in my work papers. I believe the 18 new railroad debt issues, which were issued

¹⁹ The SEC’s EDGAR (Electronic Data Gathering, Analysis, and Retrieval) system is available on the internet at the following address: <https://www.sec.gov/edgar.shtml> .

by four different railroads, provide the best information to determine flotation costs for 2018, and I have therefore used 0.078 percentage points for the flotation costs for bonds.

Flotation costs for ETCs have much less significance compared to bonds simply because ETCs are less than 3 percent of the market value of the debt used to determine the current cost of debt. I have calculated flotation costs for ETCs using the same methodology used in the previous Cost of Capital decision, although it has some flaws. See my testimony for 2012 for a discussion of the incorrect assumption used with the current method. Because ETCs are such a small portion of total debt, this flawed method for estimating flotation costs for ETCs does not affect the cost of debt, so I have not expended resources with an alternative method.

The Securities and Exchange Commission (SEC) conducted a study of flotation costs using railroad ETC data for the years 1951, 1952 and 1955.²⁰ In that study, the SEC determined that ETC flotation costs averaged 0.89 percent of gross proceeds. My calculation uses this old study, the flawed assumption about average railroad yields, and assumes the duration is 15 years. This methodology, suggested by a third party in 2008, was first approved by the Board in its cost of capital for 2007 decision served September 26, 2008.

Table 7 below calculates flotation costs for ETCs using the flotation percent of gross proceeds discussed above. No flotation costs have been calculated for CSAs, as none have been modeled.

²⁰ *Cost of Flotation of Corporate Securities 1951-1955*, Securities and Exchange Commission, June 1957.

Table No. 7
Flotation Costs for
Equipment Trust Certificates

Given	ETC
Flotation Costs as Pct of Gross Proceeds	0.890%
Avg. Railroad Yields (Table 5)	3.593%
Assumed Duration of New Instrument (Yrs)	15
 Calculated	
Price After Flotation Costs	\$99.11
Effective Yield Including Flotation Costs	3.670%
 Difference Between Yields With and Without Flotation Costs =	
Flotation Cost as Percentage Points	0.077%

In this calculation, current average yields on railroad ETCs are assumed to be equal to the yield resulting from the price to investors for a new issue (a flawed assumption because the current yields and new issues are on *different places in the yield curve*). Coupons are assumed to be paid twice per year. The duration for new ETCs is assumed to be 15 years. Given the input data, effective yields can be calculated, and the difference between the yields excluding flotation costs and the yields including flotation costs are the flotation costs measured in percentage points. The results are flotation costs for ETCs of 0.077 percentage points – which is .003 percentage points higher than the value for 2017 and closer to the current flotation cost for bonds.

To compute the overall effect of flotation cost on debt, the market value weight of the debt outstanding is multiplied by the respective flotation cost. The weights for each type of debt are based on market values for debt (excluding All Other Debt), as found in the Percent of Subtotal column in Table 6. All Other Debt is excluded from the weight

calculation, since a current cost of debt for that category has not been determined. As shown in Table 8, flotation costs increase the cost of debt by 0.078 percentage points.

Table No. 8
Flotation Costs For Debt

Type of Debt	Market Weight	Flotation Cost
Bonds, Notes & Debentures	97.85%	0.078%
Equipment Trust Certificates	2.15%	0.077%
Conditional Sales Agreements	0.00%	not calculated
Total	100.00%	0.078%

This flotation cost for 2018 is 0.009 percentage points higher than the number used by the Board in its 2017 Cost of Capital decision. Since bonds have a market weight of over 97 percent, flotation costs for total debt rounds to the same number as the flotation costs for bonds. For this year, weighting was almost irrelevant, since the ETC flotation cost was almost the same as that for bonds.

G. Conclusion as to the Cost of Debt Capital

To determine the overall composite current cost of debt, the current cost of each of three categories of debt (Bonds, ETCs and CSAs) is multiplied by its market value proportion. Market values are properly used in this connection, because they represent the amounts on which the current cost must be paid. Table 9 shows the results of this calculation.

Table No. 9
Composite Current Cost Of Debt

Type of Debt	Market Weight	Current Cost
Bonds, Notes & Debentures	97.85%	4.095%
Equipment Trust Certificates	2.15%	3.593%
Conditional Sales Agreements	0.00%	--
Subtotal	100.00%	4.084%
Flotation Costs		0.078%
Weighted Cost of Debt		4.162%
Weighted Cost of Debt (Rounded)		4.16%

The current weighted cost of debt before flotation costs is 4.084 percent. The addition of flotation costs results in a rounded cost of debt of 4.16 percent. Although this cost of debt is higher than 2017's 3.57 percent, it is lower than every cost of debt for 1978 through 2010.²¹ A summary for the 2018 calculation of the overall cost of debt is provided in Appendix F. That appendix also has some historical costs of debt for comparisons.

IV. Common Equity Capital In 2018

A. The Market Value of Common Equity Capital

The market value of common equity is based on stock prices and shares outstanding for 2018. Table 10 below summarizes the market value calculation. The Weight column, which is not used directly in our calculation, is provided as additional information.

²¹ The AAR's *Railroad Facts* book lists the cost of debt decided by the Board and its predecessor. The 2013 edition contains, on page 19, data from 1978 through 2012. The 2018 edition lists, on page 20, data from 1990 through 2017.

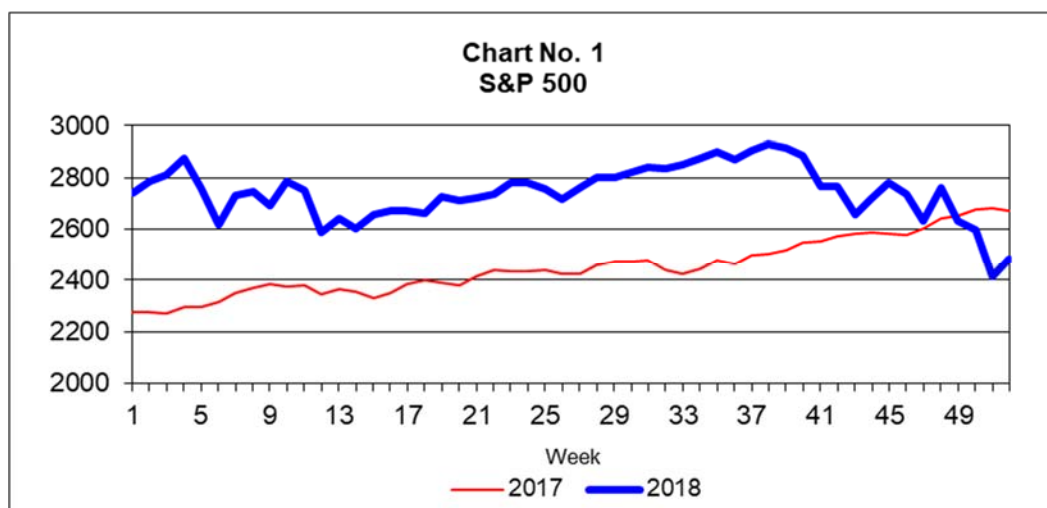
Table No. 10
Average Market Value
For Common Equity in 2018

Railroad Co.	Value (\$000)	Weight %
CSX	55,943,717.0	25.51
KSU	11,093,624.8	5.06
NSC	43,768,994.7	19.95 *
UNP	108,513,040.3	49.48
Total	\$219,319,376.7	100.00 %
* .01 deducted to force total to exactly 100.00%. Unrounded value is 19.9567%.		
Prior Year	\$181,366,630.0	
Change	20.9%	

Details of the calculation are presented in Appendix G. Weekly market values were calculated for each railroad using shares outstanding data from railroad 10-Q and 10-K reports multiplied by stock prices at the close of each week in 2018.²² Note that the week beginning on March 25 ends on Thursday March 29 because of the Good Friday holiday. Thus, any railroad shares outstanding change effective on March 30 would not happen until the following week because the market was closed on March 30. Page 6 of Appendix G lists all full-day stock market holidays. Page 5 of the appendix lists the holiday that caused any week to not begin trading on a Monday or end trading on a Friday. Calculations for 2018 included 52 weeks. Week 1 began on Tuesday January 2, 2018, and is the first week after 2017's week 52 used in last year's calculation. The week beginning Monday December 24, 2018, qualifies as the final week for 2018. Thus, 2018 is a 52-week year for the purpose of calculating the market value of common equity.

²² The 10-Q and 10-K reports are filed with the US. Securities and Exchange Commission (SEC), and are available from railroad web sites or the SEC web site.

The 52-week average market capitalization of the composite railroad (the four railroads that comprise the composite sample), listed in Table Number 10 and on page 5 of Appendix G, is \$219.3 billion. This is a 21 percent increase from last year's average.



As shown in Chart 1, the stock market in general, as represented by the Standard & Poor's 500, was also higher in 2018 than most of 2017.

B. The Capital Asset Pricing Model (CAPM)

The cost of equity is a measure of investor expectations, including the opportunity cost of investing in a share of a firm's stock; i.e., the expected rate of return that investors require on the market value (purchase price) of the stock in light of alternative investment opportunities of comparable risk. Because investor expectations are not directly observable, analysts have developed methods of inferring the cost of equity from available financial data. There are several methods available to estimate the cost of equity. Two of these methods, the Capital Asset Pricing Model (CAPM) and a Multi-Stage Discounted Cash Flow model (MSDCF) are used in this statement to compute an estimate for the cost

of equity — in accordance with STB Ex Parte No. 558 (Sub No. 22). The CAPM is discussed herein, and the MSDCF is discussed in the next section.

The theory underlying the CAPM is that an investor seeks a risk-free return plus a premium that is dependent upon risk. Since all of the principal elements of the CAPM (the risk-free rate, the market risk premium, and the beta) are estimated using historical data and relationships computed from that data, the CAPM is essentially a backward look at how equity markets have regarded a particular firm or group of firms. In formulaic terms, the cost of equity as estimated by the CAPM may be expressed as:

$$K = RF + \text{beta} (\text{MRP})$$

Where K = the firm's cost of equity,

RF = the risk-free rate,

MRP = the market's risk premium, and

beta = the coefficient of systematic, non-diversifiable risk of the stock.

Therefore, each firm's cost of equity above the risk-free rate depends on the market risk premium adjusted for the non-diversifiable risk of its common stock, with the adjustment factor represented in the model as beta. The risk-free rate (RF) is typically represented by the rate of a U.S. Government (Treasury) instrument. The market risk premium (MRP) is the expected future difference between returns for the overall stock market and risk-free returns. That expected difference is typically estimated using historical differences. Beta is the coefficient of systematic, non-diversifiable risk of the stock, which depends on its volatility and its correlation with the overall stock market. The beta for the overall stock market is 1.0. Firms with higher risk will have a beta above 1.0, while firms with lower risk will have a beta below 1.0. As with the market risk premium,

betas are also typically estimated using historical relationships. The methodology used for the CAPM calculation — including details for using certain inputs — follows the methodology prescribed and used by the STB in the 2017 Cost of Capital decision.²³

1. Risk-Free Rate (RF)

In all decisions regarding the CAPM, the Board has specified a risk-free rate based on an average yield to maturity for a 20-year U.S. Treasury Bond. The average yield-to-maturities for U.S. Treasury Bonds are available from the Federal Reserve web site, and I have again utilized this resource to retrieve data for 2018.²⁴ A copy of the “download” from the Federal Reserve web site is included in my work papers. Table 11 lists a 10-year history of this bond. As the table shows, the average rate for 20-Year U.S. Treasury Bonds in 2017 is an increase from the previous year. Appendix H lists all of the annual 20-Year U.S. Treasury Bond rates available since 1980. The 20-year rate for 2016 was the lowest rate during that period. Since that time, rates have increased for two consecutive years.²⁵

²³ *Railroad Cost of Capital – 2017*, EP 558 (Sub-No. 21) (STB served December 6, 2018).

²⁴ Federal Reserve’s new web site is <https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15>. For Data set, choose Selected Interest Rates. For Instrument, select U.S. government securities/Treasury constant maturities/Nominal. For Maturity, select 20-year. For Frequency, select Annual.

²⁵ The Federal Reserve Board has two series for 20-Year Treasury Bonds. The first data set is from 1962 through 1986. The second set has data from 1993 to current. Rates from the two data sets are listed in my work papers. There are no data for 1987 through 1992.

Table No. 11
20-Year U.S. Treasury Bonds 2009 - 2018

Year	Average Annual Rate
2009	4.11 %
2010	4.03
2011	3.62
2012	2.54
2013	3.12
2014	3.07
2015	2.55
2016	2.22
2017	2.65
2018	3.02

Source: Federal Reserve

Using the average yield to maturity in 2018 for a 20-year U.S. Treasury Bond, as directed in STB Ex Parte No. 558 (Sub No. 22), the CAPM's risk-free rate is 3.02 percent.

2. Market Risk Premium (MRP)

In previous decisions, the STB has required that the market risk premium (a.k.a. equity risk premium) calculation begin with year 1926, which is a standard approach. The Standard & Poor's 500 Index is to be used as the representative of the market — also a standard approach. The STB's decision also stated that the “data are also available from a variety of commercial vendors, including Ibbotson.”

In the 2006 through 2012 Cost of Capital determinations, the well-regarded and widely-accepted Ibbotson Equity Risk Premium was used. The premium was listed in the

Ibbotson SBBI Valuation Yearbook published by Morningstar.²⁶ This premium is the long-horizon equity risk premium, using the S&P 500 and data beginning with 1926. Although Morningstar discontinued its *Ibbotson SBBI Valuation Yearbook*, it published the same long-horizon equity risk premium in the *Ibbotson SBBI Classic Yearbook*. This source was used for 2013 and 2014 equity risk premiums.

In 2015 and 2016, yet another source of data was needed, as Morningstar decided to discontinue its *Ibbotson SBBI Classic Yearbook*. The valuation and financial advisory firm Duff & Phelps maintains many of the same series formerly published by Ibbotson, and their *Valuation Handbook-U.S. Guide to Cost of Capital* included a page that listed the long-horizon expected equity risk premium.²⁷ The Duff & Phelps *Valuation Handbook-U.S. Guide to Cost of Capital* was the source used to obtain the 2015 and 2016 equity risk premiums. In 2018, however, Duff & Phelps decided to discontinue the publication of that book in hardcover form, which would have been used as the source for the 2017 equity risk premium. Although the physical book is no longer be published, Duff & Phelps has developed an online tool called the *Cost of Capital Navigator*, and the data that would have been published in the *Valuation Handbook-U.S. Guide to Cost of Capital* are available in the online *Cost of Capital Navigator*.²⁸ The *Cost of Capital Navigator* contains the “Long-

²⁶ Ibbotson Associates is a wholly-owned subsidiary of Morningstar, Inc. “SBBI” stands for “Stocks, Bonds, Bills, and Inflation.

²⁷ The Duff & Phelps 2017 *Valuation Handbook – Guide to Cost of Capital* was published by John Wiley & Sons. The handbook listed the premium on page 36 of chapter 3 (and page 14 of chapter 5). The last sentence of Footnote 5-16 (on page 14 of Chapter 5) in the Handbook says “The long-horizon historical equity risk premium was previously published on the “back page” of the Morningstar/Ibbotson SBBI Valuation Yearbook (discontinued).”

²⁸ The References section of the online *Cost of Capital Navigator* contains the same data, in the same chapter format, that would have been published in the *Valuation Handbook – U.S. Guide to Cost of Capital*. It is essentially an online book, instead of a hardcover book.

horizon expected equity risk premium (historical)”, which is calculated using “large company stock total returns minus long-term government bond income returns”, beginning 1926. This premium is calculated using the same method as that used by Ibbotson to calculate the market risk premiums used in previous cost of capital determinations. For 2018, the online Duff & Phelps *Cost of Capital Navigator* shows this premium as 6.91 percent. This is a small decrease from the 7.07 percent figure used by the Board for 2017. (Page 1 of my Appendix H shows Equity Risk Premiums since 1980, and page 2 shows a screen shot of the on-line source for the 2018 equity risk premium.) Thus, I used 6.91 percent as the rate for the CAPM’s market risk premium.

3. Beta

The STB Ex Parte No. 664 decision requires parties to calculate the CAPM’s beta using a portfolio of weekly, merger-adjusted stock returns for the prior five years in the following equation:

$$R - SRRF = \text{Alpha} + \text{beta} (RM - SRRF) + E$$

Where:

- R = merger and dividend-adjusted stock returns for the portfolio of railroads;²⁹
- SRRF = short-run risk-free rate represented by 3-mo. U.S. Treasury Bills;
- alpha = constant term;
- beta = coefficient of systematic, non-diversifiable risk;
- RM = return for the market, represented by the S&P 500; and
- E = random error term.

In its Railroad Cost of Capital – 2006 decision, the STB clarified its beta calculation methodology. The STB noted that “[t]he proper way to arrive at the weekly portfolio

²⁹ Railroads must meet the screening criteria set forth in *Railroad Cost of Capital – 1984* and modified recently by the Board in Revisions to the *Cost-of-Capital Composite Railroad Criteria*.

change is to calculate the weekly stock percentage change for each firm, weighted by that firm's share of the industry as a whole." The STB also determined that the Standard & Poor's 500 Price Index, which is publicly available, should be used as a proxy for the Standard & Poor's 500 Total Return Index, unless the Total Return Index is made available to the public.

Using the STB instructions, the value for beta can be solved for using a linear regression. The railroad portfolio return less the short-term risk free rate is the dependent variable, while the market return less the risk free rate is the independent variable. The regression's random error term is unknown, the intercept is the alpha, and the coefficient for the explanatory variable is the beta.

The raw regression data set used in the AAR calculation has normally been derived from publicly available data from web sites on the internet (for further information, see the work papers). This year, we were originally unable to download data from the free Yahoo Finance web site, and therefore downloaded data available with our Bloomberg subscription (which became data set 1). We subsequently discovered that we could download Yahoo Finance data using a different web browser, and downloaded weekly data (data set 2).³⁰ We checked data downloaded from the free Yahoo Finance web site against data available with our Bloomberg subscription. The two data sets were the same for the stock price data, but had differences in the dividend-adjusted price data. We then downloaded daily data from Yahoo Finance, which would enable us to check the dividend-adjusted stock price data (data set 3). We replicated the dividend adjusted stock price data,

³⁰ Microsoft Internet Explorer did not work with Yahoo Finance for downloading large amounts of data, while Google Chrome worked fine.

and found that Yahoo's daily data was better than its weekly data, but still had issues.³¹ We found that the Yahoo Finance data set had errors related to dividends for NSC and UNP – which causes errors in the dividend-adjusted stock prices.³² Highlights of this problem are in Appendix Q.

Because of the data problems, we used the Yahoo Finance stock prices from the daily data set, and dividend-adjusted stock prices, but used corrected dividend-adjusted stock prices where needed in our regression data set. We then selected the end of the week data. This data set (data set 4) essentially matches the Bloomberg data set – the few exceptions are differences in the third or fourth digit after the decimal. This data correction work consumed an extensive amount of time and added a substantial amount of documentation to my work papers – all to fix a data set that essentially matched our first (Bloomberg) data set after Yahoo's dividend issues were corrected. My work papers contain original data sets, differences, the corrected data set, and calculations for the dividend adjusted stock prices. Data are also included that will enable one to know what days a stock traded (and did not trade), which can be important in determining shares outstanding for a particular week. It should be noted that the Bloomberg data set identifies each week by the last trading day of the week, which means that the stock price data and

³¹ The daily data can be used as weekly by selecting the last trading day of each week. As an example of differences between the three data sets, which were all downloaded on the same day for the same range of dates: Week 8, CSX, dividend-adjusted stock price using Bloomberg was 25.183, Yahoo weekly was 25.044, and Yahoo daily was 25.182.

³² Our first data set used data from Bloomberg. This data set became our check against the standard Yahoo data. The second data set was Yahoo Weekly data, which had differences from Bloomberg in the dividend-adjusted price data. Our third data set was Yahoo Daily, which enabled us to replicate the dividend adjusted stock price data. We found that Yahoo listed 5 dividends for NSC in 2015, contrary to the NSC 10-K and Bloomberg. We also found that for UNP, Yahoo was using a pre-split dividend for the first quarter of 2014 with stock prices adjusted for splits, also contrary to the UNP 10-K and Bloomberg.

the identification of the week are the same. Yahoo weekly data identifies the week by the beginning day of the week, but correctly uses the last day of the week for stock prices. We believe it is less confusing to identify the week by the same day that is used for the stock prices, as done in the Bloomberg data set. Because of the Yahoo data quality concerns, and the extra work correcting the Yahoo data, we plan to use Bloomberg stock price data next year.³³ For this year, it is simply a check against corrected Yahoo data.

As instructed, I have used weekly stock price data for the prior five years. The raw data consists of weekly observations from the last week of 2013 (Week 0) through the last week of 2018 (Week 260). As said earlier, Yahoo Finance identifies each week in the data set by the first trading day of the week (typically Monday), but the prices are actually for the last day of trading in the week (typically Friday).³⁴ Week 1 in the regression data set is the week beginning Monday, January 6, 2014 (or ending Friday January 10, 2014).³⁵ This week meets the Board's criterion to qualify as week 1 because it is the first week to contains 3 or more trading days in 2014. The last week of 2018, Week 260, began on Monday, December 24. Week 0 began in 2013 on Monday December 30, and it is *not* directly used in our regression for beta. The purpose of having a Week 0 is to be able to

³³ An argument to use Yahoo Finance as the stock price data source because it is free has no merit, since we already use commercial sources for bond data (Bloomberg), the CAPM's market risk premium (Duff & Phelps), and the MSDCF's expected growth rates (Refinitiv/Thomson). All three of these sources are available to anyone willing to pay for the product. The MSDCF also needs stock price data (not dividend-adjusted) for the last trading day of the last week of the year (Appendix N) – currently a total of four numbers. We may continue using Yahoo Finance for that limited purpose since their stock prices that were not adjusted for dividends have not had problems.

³⁴ In some cases, stock did not trade on Monday. For example, trading during Week 209 began Tuesday, January 2, 2018, because Monday, January 1, 2018, was the New Year's Day holiday. There are also cases where the last trading day of the week was not Friday because of a holiday. For example, Week 221 ended on Thursday, March 29, because of the Good Friday holiday on March 30.

³⁵ Following the Board's clarification in Ex Parte No. 558 (Sub-No. 12), the week beginning January 6, 2014, is the first week in the relevant year that contains 3 or more trading days. The previous week had only 2 trading days (January 2 and 3) in 2014.

calculate the return for Week 1 and to have a weight for the beginning (instead of the end) of Week 1. This enables a Week 1 return to be included in the regression data set as clarified by the Board on page 7 of its 2008 cost of capital decision.³⁶

Three categories of data are necessary for the raw regression data set. First, weekly stock prices for CSX, KSU, NSC, and UNP are acquired.³⁷ The price index values for Standard & Poor's 500 Price Index were also downloaded. Data issues were discussed earlier in this section. Stock prices adjusted for dividends and splits are used to calculate the regression's dependent variable, while prices that are only adjusted for splits are used for weighting.³⁸ The final data set was verified by comparisons to alternative sources and a check of the dividend adjusted calculations.

The second category of data is shares outstanding. Stock shares outstanding, and an effective date, were gathered from each railroad's 10-Q and 10-K reports. The shares outstanding data were adjusted for stock splits, if necessary. For each railroad, a shares outstanding value is assigned to each week based upon the latest available 10-Q or 10-K submissions by that railroad to the Securities and Exchange Commission.³⁹ In some cases, the last trading day of a week was actually a Thursday (Good Friday is always a holiday for

³⁶ EP 558 (Sub-No. 12), (STB served Sept. 25, 2009).

³⁷ CSX Corporation has a stock symbol of CSX, Kansas City Southern is KSU, Norfolk Southern Corporation is NSC, and Union Pacific Corporation is UNP.

³⁸ The dividend-adjusted values may differ for a given week if the data are downloaded at different times during the year, especially if dividends have been paid during the interim time. The difference typically affects the fourth digit after the decimal of the beta calculations. The current data sets were downloaded March 18, 2019, and the range of data was from 12/20/2013 through 3/17/2019.

³⁹ Shares outstanding are updated using the first Friday on (provided the stock traded that day), or after, the effective date listed in the 10-Q and 10-K reports – since Friday's (or the end of the week) stock price is used.

the U.S. stock markets), and this can affect the shares outstanding used. All of the days stocks traded, and stock market holidays, are listed in my work papers.

The final category of raw data is the rate for 3-Month U.S. Treasury Bills. These securities are also known as 13-Week Treasury Bills or 90-Day Treasury Bills. The Treasury Bill rates are acquired from the Federal Reserve web site, and the “download” is included in my work papers.

SAS statistical software was used to prepare the regression data set from the raw data.⁴⁰ The weekly stock percentage change for each railroad was calculated and weighted by that railroad’s share of the industry as a whole to create a composite railroad return.⁴¹ Weekly returns are also calculated for the Standard & Poor’s 500 Price Index (the proxy for the market as a whole). Each week’s three-month Treasury Bill rate, which is the measure employed for the short-run risk-free rate, is restated from an annual to a weekly rate to make it comparable to the weekly returns. The method used to convert from an annual rate to a weekly rate accounts for compounding. The weekly Treasury Bill rates are then deducted from the composite railroad portfolio returns and market returns as was done in the previous cost of capital submissions. The resulting regression data set has 260 observations (weeks 1 through 260), since week 0 of the raw data set was used only to calculate a weighted return for week 1.

The SAS General Linear Model procedure (Proc GLM) was used to calculate the regression, with composite railroad returns less the short-run risk-free rate as the dependent

⁴⁰ SAS Institute Inc., Cary, NC.

⁴¹ Since the weight needs to be the weight at the beginning of the week instead of the end of the week, data from the end of the previous period are used to represent the beginning of the current period.

variable and the market returns less the short-run risk-free rate as the independent variable. As a check against our beta calculations, a spreadsheet has also been utilized to calculate the beta using a linear regression, and the results matched the SAS calculation. As specified by the STB decisions, the regression includes an intercept. Appendix I contains a summary of the regression using SAS. The beta is the estimate of the parameter shown on the bottom of the Appendix page. The entire SAS printout and a spreadsheet version are included in my work papers. The regression using the corrected Yahoo data set resulted in a beta estimate of 1.111992957 using a spreadsheet, and 1.111998624 using SAS – both round to 1.1120.⁴² The regression using the Bloomberg data set resulted in a beta estimate of 1.111998371, which also rounds to 1.1120. The two data sets with errors in the dividend-adjusted price calculations, and in the dividends used, were not used since they have known data errors. All four data sets are in my work papers.

The 2018 beta is lower than the beta for 2017 (1.1438), and is the lowest since 2009. However, this is the tenth consecutive year that the railroad beta has been above 1.0, further demonstrating that railroad stocks are consistently more volatile and are regarded as having more risk than does the market generally.

We have evaluated our beta calculation by (1) comparing it to previous years and expectations, and (2) comparing the results of data sets from different sources. The value of 1.1120 for beta, as calculated in two spreadsheet regressions where we are confident of data quality, and using SAS, is used as an input to the CAPM.

⁴² Differences between the SAS regression and the spreadsheet regression were probably caused by the number of digits after the decimal allowed in the data sets by the two software packages.

4. Cost of Common Equity Using the CAPM

A review of the Capital Asset Pricing Model (CAPM) is as follows:

$$K = RF + \text{beta} (\text{MRP})$$

Where K = the cost of equity for the portfolio of railroads,

RF = the risk-free rate,

MRP = the market's risk premium, and

beta = coefficient of systematic, non-diversifiable risk.

Our CAPM used the methodology used by the STB in the previous cost of capital determination, Ex Parte No. 558 (Sub-No. 21). Table 12 is a summary of our CAPM cost of common equity calculation, which resulted in an average 2018 cost of equity estimate for the composite railroad of 10.70 percent. This is a small decrease from 2017's 10.74 percent, despite the higher risk free rate.

Table No. 12
Cost of Common Equity
Using STB's Capital Asset Pricing Model

<i>Inputs to Model</i>	2018	2017	
Risk-Free Rate	3.02 %	2.65 %	Table No. 11
Market Risk Premium	6.91	7.07	Appendix H
Beta	1.1120	1.1438	Appendix I
 <i>Calculation</i>			
Risk-Free Rate	3.02	2.65	Given
Plus: Beta Adj. Risk Premium	7.68	8.09	Beta x MRP
CAPM Cost of Equity	10.70 %	10.74 %	RF Rate + Prem.

C. The Multi-Stage Discounted Cash Flow Model

As stated earlier, there are several methods available to estimate the cost of equity.

The Multi-Stage Discounted Cash Flow Model (MSDCF) is another model available.

Using this model, the cost of equity is the discount rate that equates a firm's market value

to the present value of the expected stream of free cash flow that is potentially available for distribution to equity investors. The multiple stage portion of the model accounts for the assumption that the firm will not experience a constant growth rate throughout its life. These features make the MSDCF somewhat more forward looking in that it relies on the expectations of the equities markets as to the firm's future performance although its accounting treatment of cash flows remains grounded in historic relationships. Thus, its theoretical basis contrasts dramatically with the historic view of the CAPM, and brings investor perceptions of the firm's future into the process of estimating its cost of equity. As such, estimations of the cost of equity using MSDCF more closely align with section 16 of the Surface Transportation Board Reauthorization Act of 2015, which directed the agency to consider current and future conditions when evaluating railroad revenue adequacy, a key function of the STB's cost of capital calculation.

The STB, in Ex Parte No. 664 (Sub No. 1), adopted the Morningstar/Ibbotson MSDCF model to use for estimating the cost of common equity capital.⁴³ This model assumes that investor cash flows do not all have to be in the form of dividends. Instead, investors benefit from regular dividends, special dividends, stock buybacks, or stock price appreciation.⁴⁴ Major inputs to the model include cash flows, expected growth rates, and

⁴³ The Morningstar/Ibbotson MSDCF model adopted by the Board in Ex Parte No. 664 (Sub-No.1) is a modified version that includes only the railroads that pass the screening criteria set forth in Railroad Cost of Capital – 1984, 1 I.C.C. 2d 989 (1985), for inclusion in the sample of railroads used for the annual cost of capital determination. See Ex Parte No. 664 (Sub-No.1), *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, served January 28, 2009.

⁴⁴ One interested party believes that stock repurchases (buybacks) bias the MSDCF *upwardly*. However, stock repurchases have the opposite effect – they bias the MSDCF *downward*. The MSDCF does not fully reflect the reality that distributions to shareholders (buybacks) mean cash flows to investors are shifted forward in time, and earlier cash flows should raise cost of equity estimates since the present value of a dollar received today is always (unless we have deflation) greater than the present value of that same dollar received at some future date. Since the model cannot account for this shift forward in cash flows, it is likely to understate the

market values. An equation for this model can be found in Appendix J. A firm's present value as determined by the market is therefore equal to the sum of the present value of three sets of future cash flows. This is the same formula that appeared in the Appendix to the Board's decision in Ex Parte No. 664 (Sub-No.1) served August 11, 2008, and it is the same formula found in the AAR's submissions for the 2008 through 2017 cost of capital.

1. Cash Flows

The Morningstar/Ibbotson MSDCF model uses an initial cash flow and a terminal cash flow as inputs. The initial cash flow is defined as income before extraordinary items minus capital expenditures plus depreciation plus deferred taxes. Income before extraordinary items (IBEI) is derived by deducting extraordinary items from net income. Thus, the model's formula for cash flows is as follows:

$$CF = (NI - EI) - CAPEX + DEP + DT$$

Where CF = cash flow,
NI = net income,
EI = extraordinary items,
CAPEX = capital expenditures,
DEP = depreciation, and
DT = deferred taxes.

The Morningstar/Ibbotson MSDCF model utilizes five-year moving averages for each railroad. The years used in this case are 2014 through 2018. Data are copied from the Consolidated Cash Flow and Income Statement of each railroad's annual 10-K report, and any changes to prior years have been incorporated. The 10-K reports, which are filed with the Securities and Exchange Commission, are usually available each year around February.

cost of equity. See September 5, 2014, verified statement of Dr. Bente Villadsen on behalf of Association of American Railroads in Ex Parte No. 664 (Sub-No.2)

In addition to the data points listed above, sales (a.k.a. revenue) is used as part of a smoothing (or averaging) process. Table 13 illustrates the Morningstar/Ibbotson process to calculate an average cash flow. Revenue, Net Income, and Extraordinary Items are sourced from the Income Statement. Depreciation, Deferred Taxes, and Capital Expenditures are sourced from the Statement of Cash Flows. Net Income and Deferred Taxes for 2017 have been adjusted, using the same data and methodology as the Board used in its 2017 Cost of Capital determination, to remove the accounting impacts of the Tax Cuts and Jobs Act on rail carriers' deferred tax liability. Part of the increase in Net Income for 2018 was caused by the reduction in the corporate income tax rate.

Table No. 13
Example Cash Flow Calculations for CSX in 2018
(\$ in millions)

	2014	2015	2016	2017	2018	Total
Net Income	\$1,927	\$1,968	\$1,714	<u>\$1,840</u>	\$3,309	\$10,758
Less Extraord. Items	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Inc. Bef. Extraord. Items (+)	\$1,927	\$1,968	\$1,714	\$1,840	\$3,309	\$10,758
Capital Expenditures (-)	\$2,449	\$2,562	\$2,398	\$2,040	\$1,745	\$11,194
Depreciation (+)	1,151	1,208	1,301	1,315	1,331	6,306
Deferred Taxes (+)	<u>298</u>	<u>456</u>	<u>405</u>	<u>209</u>	<u>279</u>	<u>1,647</u>
Cash Flow	\$927	\$1,070	\$1,022	\$1,324	\$3,174	\$7,517
Revenue (a.k.a. "Sales")	\$12,669	\$11,811	\$11,069	\$11,408	\$12,250	\$59,207
Ratio of Cash Flow to Sales (Smoothed Ibbotson-style) = (\$7,517 / \$59,207) =						0.12696
Initial Cash Flow in 2018 (Smoothed Ibbotson-style) = (0.12696 x \$12,250) =						\$1,555.28
Ratio of IBEL to Sales (Smoothed Ibbotson-style) = (\$10,758 / \$59,207) =						0.18170
Terminal Cash Flow input (Smoothed Ibbotson-style) = (0.18170 x \$12,250) =						\$2,225.84

After the financial data are collected, they are combined (Total column in the example) into a five-year cash flow for the purpose of averaging or smoothing. The average cash flow for 2018, which is the initial cash flow in the model, is calculated by

multiplying revenue for 2018 times the five-year average ratio of cash flow to revenue. In our example here, the model's input for the initial cash flow is \$1,555.28 million. The ratio of cash flow to sales is calculated by dividing the five year total cash flow by the five year total revenue.

The model's terminal cash flow value is based on the assumptions that in the third stage of the model, depreciation equals capital expenditures, and deferred taxes are zero. Therefore, the depreciation and capital expenditures from the initial cash flow formula cancel each other, and deferred taxes are eliminated because they are zero. The remaining part of the equation for the model's terminal cash flow is income before extraordinary items (IBEI), which we calculate by subtracting extraordinary items from net income. In our Table 13 example, the model's input for the terminal cash flow is \$2,225.84 million. The model's terminal cash flow input is calculated by multiplying revenue for 2018 times the five-year average ratio of income before extraordinary items to revenue. The ratio of income before extraordinary items to sales is calculated by dividing the five-year income before extraordinary items by the five-year total revenue.

All cash flow calculations herein have been calculated using the same procedure used by the STB for the previous cost of capital determination. Appendix K contains the cash flow calculations for all four railroads, including more detail on the adjustments made to 2017 data to remove the accounting impacts of the Tax Cuts and Jobs Act on rail carriers' deferred tax liability. The pages from the 2018 10-K reports that were used as data sources for cash flows are included in my work papers. Data for prior years (2014-2017) used in this year's calculation are unchanged from last year's submission – unless restated/revised data were found in the 2018 10-K statements.

2. Growth Rates

The first stage of the Morningstar/Ibbotson MSDCF model applies to a period that is one to five years in the future. The current year (2018) is considered to be year 0. In each year of the first stage, a firm's annual earnings growth rate is assumed to be the median value of the firm's three- to five-year growth estimates that are made by railroad industry analysts after the release of the year-end financial statements. However, in Ex Parte No. 558 (Sub No. 12), the STB clarified their interpretation of the Morningstar/Ibbotson MSDCF model by specifying use of data in effect at the end of the current year as the date for growth rates, stock prices, and stock shares outstanding.⁴⁵ (Clearly, the Board's interpretation does not anticipate the use of growth estimates based on the release of audited year-end financial statements.) In Ex Parte No. 558 (Sub No. 16), the STB made another clarification in their interpretation of the Morningstar/Ibbotson MSDCF model by specifying the *last full week of the year* as the point from which stock prices should be used. Therefore, we have utilized growth rate projections that were in effect at the end of 2018, and stock prices as of December 28, 2018 – the prices at the end of the last full week for 2018.⁴⁶ Each growth rate projection was reviewed by the brokerage firm's analyst during 2018, and the stock prices were retrieved from Yahoo! Finance.

For many years, analyst growth rate estimates were collected, and distributed, by the Institutional Brokers Estimate System (a.k.a. IBES or I/B/E/S). In recent years, the IBES growth rates have been distributed by Thomson Financial (now called Refinitiv)

⁴⁵ *Railroad Cost of Capital – 2008*, EP 558 (Sub-No. 12) (STB served Sept. 25, 2009).

⁴⁶ Friday, December 28, 2018 was the last trading day for the week.

through its Eikon service.⁴⁷ Although the term “IBES” is rarely used by Thomson, many users of the data still refer to these growth rates as “IBES” growth rates. Thomson Financial has also distributed medians of the IBES growth rate estimates on a historical basis through its Thomson ONE Banker service. The median estimates provided through the Thomson ONE Banker service did not always reflect the full set of growth rate estimates. Therefore, I have utilized all estimates available from the Refinitive/Thomson Reuters Eikon service, and determined medians based on that data. These growth rates are described in the Thomson Financial Glossary as the expected annual increase in operating earnings over a company’s next full business cycle. A worktable and the source data are included in Appendix L. In the past, I have downloaded growth rate projections on the first working day of January. This enabled me to capture estimates made and/or reviewed in late December. This time, rates were downloaded on January 2. Unfortunately, the January 2 download contained current estimates from one provider that were effective January 1, 2019 – and using those estimates would be contrary to the Board’s decision served in 2009. Therefore, I have utilized estimates downloaded on December 28, 2018. All of the estimates in this download were made or reviewed in 2018, and over two thirds of the estimates were reviewed as recently as December 2018. I have included the January 2 download in my work papers, and many of the estimates match the December 28 version, but the January 2 data set was not used other than to confirm that no new estimates or reviews happened on December 29 through 31. Table 14 lists the median growth rate estimates.

⁴⁷ In October 2018, we were notified that the Financial and Risk business of Thomson Reuters is now called Refinitiv.

Table No. 14
2018 Thomson Median Growth Rate Estimates

Company	Stock Symbol	Growth Rate
CSX Corporation	CSX	27.43 %
Kansas City Southern	KSU	14.70
Norfolk Southern Corporation	NSC	17.40
Union Pacific Corporation	UNP	19.99
Simple Average		19.88

Thus, the median growth rate estimates have been retrieved using the same procedure and source used by the AAR last year. Each individual railroad’s median growth rate is used in the first stage of the Morningstar/Ibbotson MSDCF model.

The second stage of the Morningstar/Ibbotson MSDCF model applies to a period six to ten years in the future. This is *not a transition stage* where the growth rate should be smoothed between the first and third stages. Morningstar’s model assumes “that over a middle horizon, growth of any particular company will lie more in line with the industry as a whole”.⁴⁸ In other words, other companies “catch” their industry growth leaders, or the leaders fall back to the rate of the slower growth railroads. Therefore, in this stage, the cash flows at the end of year five are assumed to grow at the simple (not weighted) average of the individual firm medians used in the first stage. Any attempt to change the second stage to a transition stage is corrupting the intent of the model.

In Table 14, the average of the median growth rates is 19.88 percent, which is a large increase from 2017 (13.55 percent). Based on train-miles reported in Annual Report Form R-1, 2015 and 2016 were recession years for the railroad industry, and train-miles

⁴⁸ Ibbotson SBBI 2013 Valuation Yearbook, page 51.

have not yet recovered to 2014 levels – even if unit trains (mostly coal) are excluded.⁴⁹ Thus, it is not surprising that analysts now have higher growth expectations, especially when considering other factors such as lower tax rates and the implementation of precision scheduled railroading. These are concepts that a backward-looking model such as the CAPM would be unable to incorporate. For all railroads in the Morningstar/Ibbotson MSDCF model, a second stage growth rate of 19.88 percent is used.⁵⁰

The third stage of the MSDCF model begins 11 years in the future and continues in perpetuity. Starting in year 11, the firm's growth rate is assumed to be the long-run nominal growth rate of the aggregate U.S. economy, which can be thought of as a combination of expected inflation plus the real growth rate in Gross Domestic Product (GDP). Until the 2013 Cost of Capital determination, the long-run nominal growth rate was supplied by Morningstar/Ibbotson in its *Ibbotson SBBI Valuation Yearbook*. In September 2013, customers subscribing to the *Ibbotson SBBI Valuation Yearbook* were notified that the publication was being discontinued. The *Ibbotson® SBBI® Classic Yearbook* (Classic Yearbook) was expanded and contained some of the data needed for the Stage 3 calculation, but it was discontinued after two years. Therefore, beginning with the 2013 determination, and then more so beginning with the 2015 determination, I have continued the original Ibbotson methodology by using data available from the Federal Reserve and Bureau of Economic Analysis. Work and data sources for this third stage of the MSDCF model are shown in Appendix M.

⁴⁹ See *Railroad Ten-Year Trends 2007-2016*, page 116, Association of American Railroads. Preliminary 2017 data are also included.

⁵⁰ The model used an average rounded to 2 digits after the decimal.

As summarized on page 1 of Appendix M, the long-run expected nominal growth rate of the U.S. economy (Stage 3 growth rate of the MSDCF) is the long-term expected growth rate for real GDP plus the long-term expected inflation rate. The real GDP growth rate is simply a historical compound growth rate calculated from Bureau of Economic Analysis data beginning in 1929, and it is illustrated on pages 2 through 4 of Appendix M. This procedure has been used, and accepted, since the 2013 Cost of Capital determination, and it is the same method used by Morningstar for 2008 through 2012. Page 2 of Appendix M has a replication of the Morningstar long-term real GDP growth rate calculation for 2009 through 2012, and AAR has continued this calculation (now using 2012 dollars) up to the latest year. Pages 3 and 4 of the same Appendix show data sources used on page 2. The calculation for 2018 is 3.22 percent – very close to the 3.21 percent used for 2017.⁵¹

The second piece of our Stage 3 calculation, expected inflation, is calculated by subtracting Inflation Indexed 20-Year Treasury Bond rates from Long-Term Government Yields (which are not inflation indexed). Work for this second piece of Stage 3 is shown on page 5 of Appendix M. Using data from the Ibbotson and the Federal Reserve, I have replicated the 2008 through 2012 Ibbotson calculations for expected long-term inflation. Beginning with the 2013 Cost of Capital determination, Ibbotson did not release a rate for Inflation-Indexed 20-Year Bonds. However, I have been able to replicate their source,⁵² and Long-Term Government yields were available from Morningstar's Ibbotson SBBI

⁵¹ For the 2017 cost of capital determination, the long term real growth rate was calculated using data in constant 2009 dollars, which resulted in a 3.21 percent rate (column h, Appendix M, page 2). The BEA switched to 2012 dollars in 2019, and the same calculation using 2012 dollars results in 3.22% (column g).

⁵² See Appendix M, page 5, columns (d) and (e) for a comparison of Inflation Indexed 20-Year Treasury Bonds from the SBBI compared to 20-Year Treasury Bonds at the end of the year from the Federal Reserve web site.

Classic yearbook. This methodology to determine expected inflation was accepted every year since the 2013 cost of capital determination.

Beginning with the 2015 Cost of Capital determination, the SBBI long-term government yields are no longer available since Morningstar no longer publishes its *Ibbotson SBBI Classic Yearbook*. In lieu of the SBBI number used for part of the calculation (that is no longer available), I have used 20-Year U.S. Treasury Bond yields at the end of the year, which are very close to the numbers used by Ibbotson.⁵³ This addition to the methodology was accepted in the 2015 through 2017 cost of capital determinations, and has been used again for 2018. Comparing yields for long-term government bonds to inflation indexed bonds, I calculate an expected long-term inflation rate of 1.78 percent.

Page 1 of Appendix M summarizes my calculations shown on pages 2 through 5 (with source data) of the same Appendix. Because expected real growth in output is very stable, changes in the Stage 3 growth rate are usually determined by changes in inflation expectations. For comparison purposes, page 6 of Appendix M shows Stage 3 rates since 2008, including the two components: the expected real growth in output (as measured by Gross Domestic Product) and expected inflation. The Stage 3 rate for 2018 is 5.00 percent ($3.22 + 1.78$ as also shown on page 1 of Appendix M), which is lower than the 5.18 used for 2017. Although real growth in output is very close to the previous year, expected inflation is down. This caused the decrease in the Stage 3 Growth rate calculated for 2018. This is the same method I used for the previous year.

⁵³ See Appendix M, page 5, columns (b) and (c) for a comparison of Long-Term Government Yields from the SBBI compared to 20-Year Treasury Bonds at the end of the year from the Federal Reserve web site.

3. Market Values

The final inputs to the Morningstar/Ibbotson MSDCF model are the stock market values for the common equity of each railroad. The market values serve two purposes. First, a firm's market value is a necessary part of the MSDCF model. As stated earlier, each railroad's cost of equity in the MSDCF model is determined by solving for the discount rate that equates a firm's *market value* to the present value of the expected stream of free cash flow that is potentially available for distribution to equity investors.

Market values are also used to determine weights for combining the model's cost of equity for each individual railroad into the composite railroad mandated by the Board. Thus, Table 15 below calculates the market value for each railroad, and it uses the market values to calculate weights. Prices and shares outstanding are for common stock. Although weights are shown at three digits after the decimal, they have been left at full float for calculation purposes – and so they will total to exactly 100 percent.

Table No. 15
Equity Market Value on December 28, 2018

Company	Stock Price	Shares Outstanding	Market Value (\$mil)	Weight
CSX	\$62.08	844,420,361	52,421.6	25.794 %
KSU	\$95.59	101,697,441	9,721.3	4.783
NSC	\$148.01	272,346,940	40,310.1	19.835
UNP	\$136.78	736,790,118	100,778.2	49.588
Total		1,955,254,860	\$203,231.1	100.000 %

As directed by the Board, I have used stock prices (from Yahoo Finance) for December 28, 2018, the last trading day of the week that qualifies as the last week of 2018 for cost of capital purposes. I have also used the shares outstanding for that day from the 2018 Q3 10-Q reports (the latest information available prior to December 28, 2018) filed

with the Securities and Exchange Commission. Market value is simply each firm's stock price multiplied by its shares outstanding, and weights are based on the market values. Appendix N contains the stock price pages as retrieved from Yahoo Finance, and it also contains the 10-Q pages used for shares outstanding.⁵⁴

4. Cost of Common Equity Using the MSDCF Model

The equation found in Appendix J provides the mathematical formula that is used to generate the three-stage DCF cost of equity estimates for each railroad. The left side of this equation is the market value of the firm in year 0. The right side of the equation is the discounted value of the cash flows from the three stages of the firm's expected future growth. Essentially, this equation is solved for each firm by simply testing discount rates (cost of equity) in an effort to find one that causes the sum of the present values of the cash flows for the three stages to be equal to the market value at year 0. An iterative process can be used to narrow down the possible solutions to the ultimate answer, or Microsoft Excel's Solver function can be used to automate the process.⁵⁵

Applying the methods described above, I have calculated a cost of common equity for each of the four railroads specified using a spreadsheet like the one utilized in the 2017 filing. Using an initial cash flow, an input for calculating the terminal cash flow, growth rates for each of the three stages, and a market value effective December 28, 2018, I have solved for the discount rate (cost of equity) that causes the sum of the present values of

⁵⁴ Although we found some errors in dividend-adjusted stock prices downloaded from Yahoo Finance when examining the data set to be used for the CAPM's beta calculation, no problems were found with regular stock prices.

⁵⁵ A commonly used Excel user's manual describes the Solver function as follows: "Solver is an Excel add-in that goes several steps further than goal seeking. It uses the same basic trial-and-error approach (known to scientific types as an iterative approach), but it's dramatically more intelligent than goal seeking." See Matthew McDonald, Excel: *The Missing Manual*, O'Reilly Media, 2005, p. 519.

cash flows for each stage to equal the firm’s market value.⁵⁶ The spreadsheet used for the calculations is displayed in Appendix O.

The resulting costs of common equity for each railroad, using the Board’s MSDCF, are shown in Table 16. In the same table, I have also calculated an MSDCF cost of common equity (using weights from Table 15 and the individual railroad cost of equities) for the composite railroad, which is the current cost of equity for this model.

Table No. 16
Cost of Equity Using STB's Ibbotson MSDCF

Company	Weight	Cost of Equity	Weighted Calculation
CSX	25.794%	17.66 %	4.55
KSU	4.783%	14.67	0.70
NSC	19.835%	15.96	3.17
UNP	49.588%	17.32	8.59
Total	100.000%		
Weighted Current Cost of Equity			17.01 %

Thus, the MSDCF produces a cost of common equity of 17.01 percent for 2018 – an increase from the 12.18 percent used by the Board for 2017. Given higher interest rates and lower income tax rates, it is logical that investors expect and require higher returns on their investments.

D. Conclusion as to the Cost of Common Equity Capital

In the STB’s Ex Parte No. 558 (Sub-No. 22) decision served February 15, 2019, the Board specified that comments “should focus ... using the methodology followed in *Railroad Cost of Capital – 2017*”, which means that a simple average of the estimates

⁵⁶ As noted in Appendix K, cash flow data for 2017 utilizes the Board’s adjustments to net income and deferred taxes that remove the impact of the Tax Cuts and Jobs Act.

produced by the CAPM adopted in STB Ex Parte No. 664 and the Morningstar/Ibbotson Multi-Stage DCF Model specified in STB Ex Parte 664 (Sub No. 1) should be used. Table 17 contains the cost of common equity estimated by each model, and a simple average of the estimates. Observing the estimates for the two cost of equity models, one can notice a difference between them that is larger than that for 2015, when the two models were almost identical. In the current year's case, we believe that the CAPM would have difficulty capturing the impact of the recently-signed Tax Cuts and Jobs Act. It would therefore be wrong to claim the estimate using the MSDCF was too high by wrongly assuming the CAPM was the better model. In this year's cost of capital calculations, the CAPM was the only piece that had a decrease in cost – the MSDCF, Preferred Equity, and Debt all had increases. Thus, given the increases for all of the other cost of capital components, one would have to question the accuracy of the CAPM. In all probability, the CAPM is too low this year because it has no way to account for the lower corporate tax rate and increased investor expectations as the railroads incorporate new efficiency programs.⁵⁷ Once again, it should be noted that each cost of equity model has its strengths and weaknesses, and this illustrates the Board's wisdom in using more than one model to estimate the cost of common equity.⁵⁸

⁵⁷ Although the CAPM is currently favored by groups that want a low cost of equity calculation, that has not always been true. In the 1981 Cost of Capital determination, Ex Parte No. 415 decided June 11, 1982, the Interstate Commerce Commission noted that "In general, the various shipper groups dislike the use of the CAPM methodology for determining the railroads' cost of equity capital."

⁵⁸ Utility companies also believe multiple cost of equity models are appropriate, as noted in STB Ex Parte 664 (Sub-No. 2) testimony on behalf of the Association of American Railroads entered July 23, 2015.

Table No. 17
Cost of of Common Equity Capital

Model		
Capital Asset Pricing Model	10.70 %	From Table No. 12
Multi-Stage Discounted Cash Flow	17.01	From Table No. 16
Cost of Common Equity	13.86 %	Average

The cost of common equity for 2018 is 13.86 percent, which is above the 11.46 percent decided for 2017.

V. Preferred Equity Capital in 2018

There were no preferred stock shares outstanding for the composite railroad sample from 2002 through 2012. Beginning 2013, one of the railroad companies comprising the railroad composite sample had preferred stock outstanding. This continues in 2018, although the market value of the preferred stock remains very small.

A. Overview of Preferred Stock

Preferred stock is a hybrid security which has some characteristics of debt and some characteristics of equity. The general characteristics of preferred stock are as follows:

1. It is an equity security similar to common stock in that it represents ownership in the corporation.
2. It has dividend preference over common stock in that it has prior claim on the corporation's earnings before dividends are paid to holders of common stock.
3. It is a security which typically has a stated rate of return or fixed dividend. (If the stock has a par value, it will state the annual dividend payments in terms of percentage of par value – for example, a 6 percent preferred. No-par value preferred stock has a dividend stated in a dollar amount, for example, a \$6 preferred.)
4. It is a security that pays dividends only if they are declared by the board of directors. (If there are no earnings, the dividends may be paid out of earned surplus. In any event, dividends must be declared by the board.)
5. It has prior claim over assets at dissolution. If the corporation is liquidated, the holders of preferred stock, like bondholders, have a prior claim on assets

over common stock shareholders. Therefore, preferred stock is also referred to as a senior security.

6. Ownership privileges are limited. (Preferred stock usually carries no voting right. In most instances, it does not participate in earnings above a set amount. The preemptive right to buy new securities is limited.)
7. It generally has no maturity date or maturity value. (The exception is sinking fund preferred issues which effectively must be retired at some future date.)

There are numerous types of preferred stock. The chief distinction among different types of preferred stock is the method and amount of dividend payment to the investor. In addition, there are specific privileges related to each type. Major types of preferred stock are listed below.

1. *Cumulative* - Occasionally, a board will decide not to pay dividends. If the stock is cumulative, unpaid dividends accumulate and the total accumulated (in arrears) must be paid to the holder of cumulative preferred stock before any dividends can be paid to the common stockholders. Most preferred stocks are cumulative.
2. *Noncumulative* - When business is such that the corporation's board of directors decides not to pay dividends, holders of noncumulative preferred stock lose their dividends. These dividends cannot be claimed in the future.
3. *Participating* - Owners of participating preferred stock receive – in addition to their fixed dividend – a share in the earnings remaining after all senior securities have been paid. If any additional dividend is declared, it is generally declared along with the common stock dividend. Participating preferred stock may also be cumulative, noncumulative or convertible.
4. *Redeemable* - Preferred stock is usually callable immediately. This means that the issuer can retire the stock at any time, if the company has the necessary cash. In some instances, as with so-called sinking fund preferred, the issuer is required to redeem the stock over a specified period of time. Generally, when redemption occurs, the firm must pay a premium price to the holder of the instrument.
5. *Auction Market* - This stock represents a new variety of variable-rate preferred stock. This security is generally appropriate for corporations with "temporary" idle corporate funds. The dividends, payable every seven weeks in the case of most issues, are determined by bids from current holders and potential buyers. The Auction Market Preferred shares are redeemable at the issuer's option, in whole or in part, on or near the interest payment date.
6. *Convertible* - A preferred stock is convertible if the holder has the privilege of converting the preferred stock into common stock at specified prices. This is an advantage to the holder if the market price of common stock increases. Often the convertible preferred will sell at a premium (above conversion parity) because of the conversion feature, especially as the selling price of common issues increase. Dividends of convertible preferred stock can also be cumulative or noncumulative.

B. The Market Value of Preferred Equity Capital

The market value of preferred equity is based on stock prices and shares outstanding for 2018. Kansas City Southern is the only railroad included in the composite railroad sample that has preferred stock. Table 18 below summarizes the market value calculation. The Weight column, which is not used directly in our calculation, is provided as additional information (which would be more useful if more than one railroad had preferred stock). Calculations are shown in Appendix P.

Table No. 18
Average Market Value
For Preferred Equity in 2018

Railroad Co.	Value (\$000)	Weight %
CSX	\$0.0	0.00
KSU	6,173.4	100.00
NSC	0.0	0.00
UNP	0.0	0.00
Total	\$6,173.4	100.00 %
Prior Year	\$6,762.9	

C. The Cost of Preferred Equity Capital

The cost of preferred equity depends, in large part, on its specific features. Three methods for determining the cost of preferred equity capital are listed below.

1. *The Dividend Yield Method* is used when the preferred stock is not convertible and there is no specific requirement to redeem the preferred. It is also used to cost preferred issues retired or redeemed during the year. The current cost in this instance is computed by dividing the stated dividend by the current market price. This method was used for all preferred stock in the 2002 cost of capital proceeding. This was also the method used for Kansas City Southern preferred stock in 1999, which was the

last time Kansas City Southern was part of the composite railroad until 2013.

2. The *Internal Rate of Return Method* is used for preferred stocks which are not convertible but are subject to a mandatory redemption schedule providing a premium over the stated/par value. The current cost is equal to rate of return which equates the current price with the present value of dividends plus the redemption price.
3. The *Common Equity Method* is used when the preferred stock is convertible at the option of the holder, and the market values of the preferred and common stock indicate that conversion is likely to occur or the conversion right is influencing the price of the preferred stock. In this case, the preferred equity has the same cost as common equity.

The preferred stock that is part of the composite railroad belongs to Kansas City Southern. This stock is not convertible, and is non-cumulative. Therefore, I have used the Dividend Yield Method to estimate the cost of preferred equity. This is the same method used for 2013 through 2017. The formula for the Dividend Yield Method is simply the annual dividends divided by the average price for the year. In this year's case, the cost of preferred equity is 3.70 percent, an increase from the 3.58 percent calculated for 2017. Appendix P provides more detail for this calculation. The Kansas City Southern 10-K report did not list quarterly high and low stock prices for its preferred stock as it had in the past, so data from Yahoo Finance was used to get the highs and lows that appear in the appendix.⁵⁹ The source data are included in my work papers. Table 19 summarizes my findings.

⁵⁹ Dividend-adjusted stock prices are not needed in this cost of preferred equity calculation.

Table No. 19
Cost of Preferred Equity Capital

Company	Weight	Cost of Equity	Weighted Calculation
CSX	0.00%	-- %	0.00
KSU	100.00%	3.70	3.70
NSC	0.00%	--	0.00
UNP	0.00%	--	0.00
Total	100.00%		
Weighted Current Cost of Equity			3.70 %

VI. The Overall Cost of Capital In 2018

A. Determination of Market Value Weights

With more detail shown in Tables 6, 10, and 18, the average market value of debt, common equity, and preferred equity are \$44.7 billion, \$219.3 billion, and \$6.2 million (not billion), respectively. More market value detail are provided in Appendixes D, G, and P. The figure for the market value of debt includes market values of bonds, notes, debentures, equipment trust certificates, and conditional sales agreements (if there had been any). Other debt and capitalized leases are included at their book value, because market values are difficult to determine (in some instances book values correspond to market values) and because these other instruments are a minimal portion of all railroad debt.

Based on the market value calculations, the capital structure for 2018 has weights for debt, common equity, and preferred equity of 16.92 percent, 83.08 percent, and 0.00 percent, respectively. Table 20 contains the weights computation and a comparison to the previous year. Note that the weight for preferred equity again rounds to zero.

Table No. 20
Capital Structure and Weights

	Source Table	2018		2017	
		Market Value (mil)	Capital Structure Weight	Market Value (mil)	Capital Structure Weight
Debt	6	\$44,652.0	16.92 %	\$39,778.0	17.99 %
Common Equity	10	219,319.4	83.08	181,367.6	82.01
Preferred Equity	18	6.2	0.00	6.8	0.00
Total		\$263,977.5	100.00 %	\$221,152.3	100.00 %

The market value for debt, common equity, and preferred stock all increased from the prior year. Weights shifted closer to their values for 2014. Debt decreased 1.07 percentage points from 2017, while common equity increased by that amount, and preferred remains at zero.

B. The Overall Cost of Capital

Multiplying the cost of debt, the cost of common equity capital, and the cost of preferred equity capital, by their respective market value proportions, results in a 2018 overall cost of capital of 12.22 percent, as shown in Table 21. This figure is similar to the overall cost of capital found for 2005.

Table No. 21
Weighted Current Cost of Capital for 2018

	Source Table	Capital Structure Weight	Current Cost
Debt	11	16.92 %	4.16 %
Common Equity	18	83.08	13.86
Preferred Equity	20	0.00	3.70
Total		100.000 %	
Weighted Current Cost of Capital			12.22 %

VII. Qualifications of John T. Gray

My name is John T. Gray. I am Senior Vice President — Policy and Economics for the Association of American Railroads (AAR), with offices located at 425 Third Street SW, Suite 1000, Washington, D.C. 20024. Among other responsibilities, my duties include the collection, analysis, and presentation of economic data related to railroads and their economic environment. One of my principal duties is conducting and supervising economic, financial, statistical and cost studies dealing with various aspects of the rail industry.

Prior to joining the AAR, I worked for Union Pacific Railroad where my most recent position was as Executive Director, responsible for the commercial relationship with other transportation carriers and ports, and for strategic policy analysis on issues involving regulatory proposals, legislation and potential litigation. I have also held marketing, planning, and operating positions with other railroads including the Southern Pacific, the Burlington Northern and the Alaska Railroad. I began my railroad career at Atchison, Topeka, and Santa Fe in their cost analysis organization. Additionally, I have also worked for ARCO Alaska.

At Southern Pacific, I was responsible for network planning, analysis, and management, as well as the company's cost analysis organization. I provided testimony on behalf of Southern Pacific regarding the economic impact to the company of the proposed combination of the Chicago and North Western Transportation Company with Union Pacific Railroad. Later, I provided extensive testimony on the economic position of Southern Pacific during the STB's review of the merger application for Union Pacific and Southern Pacific.

I hold both a Bachelors and Masters degree in Civil Engineering from Tulane University and did post-graduate work in mathematical modeling of transportation networks and rail cost systems at Northwestern University. I have also served on the faculty at the University of Alaska, where my work included network modeling and research concerning the interrelationship of transportation and economic development.

VERIFICATION

WASHINGTON, D.C.)
) SS.

I, John T. Gray, being duly sworn, state that I have read the foregoing statement, that I know its contents, and that those contents are true as stated.



JOHN T. GRAY

Subscribed and sworn to before me this 22 day of April 2019.



Notary Public

My Commission expires:



ELIZABETH J. EAGNON
NOTARY PUBLIC DISTRICT OF COLUMBIA
My Commission Expires October 14, 2022

Appendix A
Bonds, Notes and Debentures

Summaries

CSX Corporation	A-1
Kansas City Southern	A-4
Norfolk Southern Corporation	A-7
Union Pacific Corporation	A-10

Individual Bonds, Notes, and Debentures

CSX Corporation	A-13
Kansas City Southern	A-46
Norfolk Southern Corporation	A-59
Union Pacific Corporation	A-89

CSX Corporation
12/31/2018

					Coupon	Maturity	Amt. Outstanding (\$000)		Average	Market		Interest
Type	Description	No.	CUSIP		Rate	Date	Year-End	Used	Price	Value	Average	Cost
Traded												
1	Notes	CSX Corp.	1	126408GT4	3.700%	10/30/2020	\$500,000	\$500,000	101.347	\$506,733	3.110%	\$15,759
2	Notes	CSX Corp.	2	12641LBD4	9.870%	2/12/2021	\$10,000	\$10,000	113.579	\$11,358	4.240%	\$482
3	Notes	CSX Corp.	3	126408GV9	4.250%	6/1/2021	\$350,000	\$350,000	102.649	\$359,271	3.290%	\$11,820
4	Notes	CSX Corp.	4	126408AQ6	8.100%	9/15/2022	\$69,081	\$69,081	115.339	\$79,677	4.070%	\$3,243
5	Notes	CSX Corp.	5	126408AM5	8.625%	5/15/2022	\$81,517	\$81,517	116.705	\$95,134	3.890%	\$3,701
6	Notes	CSX Corp.	6	126408GZ0	3.700%	11/1/2023	\$500,000	\$500,000	101.149	\$505,746	3.460%	\$17,499
7	Notes	CSX Corp.	7	126408HB2	3.400%	8/1/2024	\$550,000	\$550,000	99.115	\$545,133	3.570%	\$19,461
8	Notes	CSX Corp.	8	126408HD8	3.350%	11/1/2025	\$600,000	\$600,000	97.357	\$584,141	3.770%	\$22,022
9	Notes	CSX Corp.	9	126408HE6	2.600%	11/1/2026	\$700,000	\$700,000	91.066	\$637,463	3.880%	\$24,734
10	Notes	CSX Corp.	10	126408BP7	7.250%	5/1/2027	\$83,312	\$83,312	119.795	\$99,804	4.500%	\$4,491
11	Notes	CSX Corp.	11	126408BM4	7.950%	5/1/2027	\$64,266	\$64,266	123.579	\$79,419	4.650%	\$3,693
12	Notes	CSX Corp.	12	126408HH9	3.250%	6/1/2027	\$850,000	\$850,000	95.011	\$807,590	3.930%	\$31,738
13	Notes	CSX Corp.	13	12641LBU6	6.800%	12/1/2028	\$200,000	\$200,000	119.676	\$239,352	4.420%	\$10,579
14	Notes (New)	CSX Corp.	14	126408HJ5	3.800%	3/1/2028	\$800,000	\$700,000	98.494	\$689,457	3.990%	\$27,509
15	Notes (New)	CSX Corp.	15	126408HM8	4.250%	3/15/2029	\$350,000	\$43,750	101.180	\$44,266	4.110%	\$1,819
16	Notes	CSX Corp.	16	126408GH0	6.000%	10/1/2036	\$400,000	\$400,000	119.578	\$478,310	4.430%	\$21,189
17	Notes	CSX Corp.	17	126408GK3	6.150%	5/1/2037	\$700,000	\$700,000	121.359	\$849,515	4.460%	\$37,888
18	Notes	CSX Corp.	18	126408GP2	7.450%	4/1/2038	\$79,226	\$79,226	130.044	\$103,029	5.030%	\$5,182
19	Notes	CSX Corp.	19	126408GS6	6.220%	4/30/2040	\$660,000	\$660,000	122.768	\$810,271	4.570%	\$37,029
20	Notes	CSX Corp.	20	126408GU1	5.500%	4/15/2041	\$550,000	\$550,000	113.307	\$623,187	4.560%	\$28,417
21	Notes	CSX Corp.	21	126408GW7	4.750%	5/30/2042	\$600,000	\$600,000	103.939	\$623,636	4.490%	\$28,001
22	Notes	CSX Corp.	22	126408GX5	4.400%	3/1/2043	\$300,000	\$300,000	99.121	\$297,362	4.460%	\$13,262
23	Notes	CSX Corp.	23	126408GY3	4.100%	3/15/2044	\$800,000	\$800,000	94.977	\$759,815	4.440%	\$33,736
24	Notes	CSX Corp.	24	126408HF3	3.800%	11/1/2046	\$800,000	\$800,000	90.429	\$723,433	4.400%	\$31,831
25	Notes (New)	CSX Corp.	25	126408HK2	4.300%	3/1/2048	\$850,000	\$743,750	96.741	\$719,510	4.500%	\$32,378
26	Notes (New)	CSX Corp.	26	126408HN6	4.750%	11/15/2048	\$650,000	\$81,250	100.559	\$81,704	4.720%	\$3,856
27	Notes	CSX Corp.	27	126408HC0	3.950%	5/1/2050	\$600,000	\$600,000	90.470	\$542,818	4.520%	\$24,535
28	Notes	CSX Corp.	28	126408HA4	4.500%	8/1/2054	\$450,000	\$450,000	97.121	\$437,043	4.670%	\$20,410
29	Notes	CSX Corp.	29	126408HG1	4.250%	11/1/2066	\$700,000	\$700,000	88.056	\$616,392	4.900%	\$30,203
30	Notes (New)	CSX Corp.	30	126408HL0	4.650%	3/1/2068	\$350,000	\$306,250	94.350	\$288,946	4.960%	\$14,332
31	Notes	CSXT - Conrail	31	126410LK3	9.750%	6/15/2020	\$227,171	\$227,171	112.031	\$254,503	3.220%	\$8,195
32	Notes	CSXT - Conrail	32	126410LL1	7.875%	5/15/2043	\$99,989	\$99,989	140.900	\$140,885	4.990%	\$7,030
33	Sec'd Eq Notes	CSXT	33	126410LM9	6.251%	1/15/2023	\$195,852	\$195,852	108.932	\$213,346	4.060%	\$8,662
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Total							\$14,720,414	\$13,595,414		\$13,848,244	4.222%	\$584,689

CSX Corporation
12/31/2018

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
							Year-End	Used				
							Trading Data Not Available or Did Not Trade					
1	Notes	CSX Corp.			2.890%	10/22/2044	73,304	73,304	100.000	\$73,304		
2	Conrail Tax Note	CSXT			2.890%	10/22/2044	151,334	151,334	100.000	\$151,334		
3	Other Notes	TORCO Toledo Ore Railroad Co.			6.450%	12/15/2021	29,700	29,700	100.000	\$29,700		
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Total							\$254,338	\$254,338		\$254,338		

CSX Corporation
12/31/2018

Maturities											
Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
						Year-End	Used				
Matures in 2019											
1											
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Total						\$0					

Grand Totals

Total Traded and Trading Data Not Available	\$14,974,752	\$13,849,752	\$14,102,582
Grand Total (for reconciliation to carrier data only)	\$14,974,752		

From CSX:

Corporate Notes	\$14,270,706
Convertible Debt	0
CSXT Notes	478,494
Secured Equipment Notes	195,852
Other Notes	<u>29,700</u>
Total	\$14,974,752

Kansas City Southern Corporation
12/31/2018

										Market		Interest
Type		Description	No.	CUSIP	Coupon	Maturity	Amt. Outstanding (\$000)		Average	Value	Average	Cost
					Rate	Date	Year-End	Used	Price	(\$ 000)	Yield	(\$ 000)
Traded												
1	Sr Note	KCSR	34	485188AN6	4.300%	5/15/2043	\$1,179	\$1,179	93.630	\$1,104	4.740%	\$52
2	Sr Note	KCSR	35	485188AM8	3.850%	11/15/2023	\$776	\$776	97.897	\$760	4.300%	\$33
3	Sr Note	KCSR	36	485188AP1	4.950%	8/15/2045	\$792	\$792	97.591	\$773	5.130%	\$40
4	Sr Note	KCS	37	485170AF1	7.000%	12/15/2025	\$221	\$221	109.744	\$243	5.390%	\$13
5	Sr Note	KCS	38	485170AQ7	4.300%	5/15/2043	\$448,651	\$448,651	95.918	\$430,336	4.580%	\$19,709
6	Sr Note	KCS	39	485170AR5	3.850%	11/15/2023	\$199,224	\$199,224	98.942	\$197,115	4.080%	\$8,042
7	Sr Note	KCS	40	485170AS3	4.950%	8/15/2045	\$499,165	\$499,165	104.232	\$520,291	4.680%	\$24,350
8	Sr Note	KCS	41	485170AU8	2.350%	5/15/2020	\$257,346	\$257,346	98.489	\$253,456	3.240%	\$8,212
9	Sr Note	KCS	42	485170AV6	3.000%	5/15/2023	\$439,123	\$439,123	96.719	\$424,714	3.760%	\$15,969
10	Sr Note	KCS	43	485170BA1	3.125%	6/1/2026	\$250,000	\$250,000	93.076	\$232,691	4.170%	\$9,703
11	Sr Note (New)	KCS	44	485170BB9	4.700%	5/1/2048	\$500,000	\$333,333	98.425	\$328,084	4.800%	\$15,748
12	Sr Note	KCSM	45	485161AQ6	2.350%	5/15/2020	\$17,594	\$17,594	97.516	\$17,157	3.810%	\$654
13	Sr Note	KCSM	46	485161AS2	3.000%	5/15/2023	\$5,560	\$5,560	94.696	\$5,265	4.230%	\$223
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Total							\$2,619,631	\$2,452,964		\$2,411,988	4.260%	\$102,748

Kansas City Southern Corporation
12/31/2018

2020-2020												
Type		Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
							Year-End	Used				
Trading Data Not Available or Did Not Trade												
1	RRIF Loan	KCSR			2.960%	2/24/2037	43,609.2	43,609	100.000	\$43,609		
2	FRA RRIF	TexMex			4.290%	7/13/2030	30,440.9	30,441	100.000	\$30,441		
3	WF Loan	KCSM			9.310%	12/15/2020	15,562.5	15,563	100.000	\$15,563		
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30												
Total							\$89,613	\$89,613		\$89,613		

Kansas City Southern Corporation
12/31/2018

Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
						Year-End	Used				
Matures in 2019											
1											
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10											
Total						\$0					

Grand Totals

Total Traded and Trading Data Not Available	\$2,709,244	\$2,542,577	\$2,501,600
Grand Total (for reconciliation to carrier data only)	2,709,243.6		

From KSU:

KCSR	\$46,356.2
TexMex	30,440.9
KCS	2,593,730.0
KCSM	<u>38,716.5</u>
Total	2,709,243.6

Norfolk Southern Corporation
12/31/2018

Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)	
						Year-End	Used					
Traded												
1	Debenture	Southern Railway	47	655855FA7	9.750%	6/15/2020	\$313,741	\$313,741	112.253	\$352,185	3.110%	\$10,953
2	Debenture	Southern Railway	48	655855FB5	7.875%	5/15/2043	\$138,085	\$138,085	145.229	\$200,539	4.760%	\$9,546
3	Notes	Series A NSC	49	655844AA6	9.000%	3/1/2021	\$83,372	\$83,372	113.128	\$94,317	3.710%	\$3,499
4	Notes	Senior	50	655844AQ1	7.250%	2/15/2031	\$284,028	\$284,028	131.902	\$374,638	4.010%	\$15,023
5	Notes	Senior	51	655844BG2	3.250%	12/1/2021	\$500,000	\$500,000	100.101	\$500,503	3.230%	\$16,166
6	Notes	Senior	52	655844BJ6	3.000%	4/1/2022	\$600,000	\$600,000	99.109	\$594,656	3.270%	\$19,445
7	Notes	Senior	53	655844BL1	2.903%	2/15/2023	\$596,450	\$596,450	98.034	\$584,726	3.380%	\$19,764
8	Notes	Senior 144A	54	655844BK3	2.903%	2/15/2023	\$3,550	\$3,550	98.011	\$3,479	3.380%	\$118
9	Notes	Senior	55	655844BD9	6.000%	5/23/2111	\$121,731	\$121,731	119.565	\$145,547	5.020%	\$7,306
10	Notes	Senior 2105	56	655844AV0	6.000%	3/15/2105	\$184,118	\$184,118	112.512	\$207,155	5.330%	\$11,041
11	Notes	Senior	57	655844AX6	5.640%	5/17/2029	\$210,316	\$210,316	112.256	\$236,091	4.220%	\$9,963
12	Notes	Senior	58	655844AW8	5.590%	5/17/2025	\$251,172	\$251,172	110.579	\$277,744	3.820%	\$10,610
13	Notes	Senior	59	655844BH0	4.837%	10/1/2041	\$595,504	\$595,504	106.663	\$635,185	4.380%	\$27,821
14	Notes	Senior	60	655844BM9	3.950%	10/1/2042	\$600,000	\$600,000	94.636	\$567,814	4.310%	\$24,473
15	Notes	Senior	61	655844BN7	4.800%	8/15/2043	\$291,829	\$291,829	104.498	\$304,955	4.510%	\$13,753
16	Notes	Senior	62	655844BP2	3.850%	1/15/2024	\$400,000	\$400,000	101.609	\$406,435	3.530%	\$14,347
17	Notes	Senior	63	655844BQ0	4.450%	6/15/2045	\$500,000	\$500,000	101.365	\$506,824	4.370%	\$22,148
18	Notes	Senior	64	655844BR8	4.650%	1/15/2046	\$600,000	\$600,000	104.373	\$626,236	4.380%	\$27,429
19	Notes	Senior	65	655844BS6	2.900%	6/15/2026	\$600,000	\$600,000	94.315	\$565,891	3.740%	\$21,164
20	Notes	Senior	66	655844BT4	3.150%	6/1/2027	\$300,000	\$300,000	95.214	\$285,643	3.790%	\$10,826
21	Notes (Exchange)	Senior	67	655844BX5	3.942%	11/1/2047	\$749,997	\$437,498	91.954	\$402,298	4.440%	\$17,862
22	Notes (Exchange)	Senior	68	655844BV9	4.050%	8/15/2052	\$749,994	\$437,497	91.931	\$402,194	4.520%	\$18,179
23	Notes (New)	Senior	69	655844BY3	4.150%	2/28/2048	\$500,000	\$416,667	96.337	\$401,402	4.380%	\$17,581
24	Notes (New)	Senior	70	655844BY3	4.150%	2/28/2048	\$200,000	\$83,333	94.500	\$78,750	4.490%	\$3,536
25	Notes (New)	Senior	71	655844CA4	3.650%	8/1/2025	\$300,000	\$125,000	99.659	\$124,574	3.710%	\$4,622
26	Notes (New)	Senior	72	655844BZ0	3.800%	8/1/2028	\$400,000	\$166,667	98.880	\$164,800	3.940%	\$6,493
27	Notes (New)	Senior	73	655844CB2	5.100%	8/1/2118	\$600,000	\$250,000	97.626	\$244,065	5.230%	\$12,765
28	Conrail Notes	CR NSC 2027	74	655844AJ7	7.800%	5/15/2027	\$319,135	\$319,135	128.816	\$411,096	3.920%	\$16,115
29	Conrail Notes	CR NSC 2037	75	655844AF5	7.050%	5/1/2037	\$178,995	\$178,995	130.763	\$234,059	4.590%	\$10,743
30	Conrail Notes	CR NSC 2097	76	655844AK4	7.900%	5/15/2097	\$225,222	\$225,222	143.594	\$323,406	5.480%	\$17,723
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Total							\$11,397,239	\$9,813,909		\$10,257,206	4.105%	\$421,015

* CUSIP 655844BY3 was offered during 2018 in two portions at differing times, and is therefore split (this time) herein for weighting purposes.

Norfolk Southern Corporation
12/31/2018

PORTFOLIO											
Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
						Year-End	Used				
Trading Data Not Available or Did Not Trade											
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Total						\$0	\$0		\$0		

Norfolk Southern Corporation
12/31/2018

Matures in 2019												
Type		Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
							Year-End	Used				
Matures in 2019												
1	Notes	Senior		655844BC1	5.900%	6/15/2019	\$500,000					
2	Other Bond	NSC Poca Dev Timber Bond			8.250%	10/1/2019	75,734					
3	Other Bond	NSC Poca Dev Timber Zero Coupon			0.000%	10/1/2019	9,168					
4												
5												
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7												
8												
9												
10												
Total							\$584,902					

Grand Totals

Total Traded and Trading Data Not Available	\$11,397,239	\$9,813,909	\$10,257,206
Grand Total (for reconciliation to carrier data only)	\$11,982,141		

From NSC:

Income Debentures	\$451,826
Medium Term Notes & Conrail Notes	11,445,413
Other Debt (Poca Dev)	84,902
Total	\$11,982,141

Union Pacific Corporation
12/31/2018

			Coupon	Maturity	Amt. Outstanding (\$000)		Average	Market		Interest	
Type	Description	No.	CUSIP	Rate	Date	Year-End	Used	Price	Value	Average	Cost
Traded											
1	Debentures	UP Corp.	77	907818CS5	5.375%	6/1/2033	\$182,564	\$182,564	112.818	\$205,965	\$8,671
2	Debentures	UP Corp.	78	907818CX4	6.150%	5/1/2037	\$108,773	\$108,773	122.047	\$132,754	\$5,854
3	Debentures	UP Corp.	79	907818CU0	6.250%	5/1/2034	\$175,867	\$175,867	122.249	\$214,996	\$9,245
4	Debentures	UP Corp.	80	907818CF3	6.625%	2/1/2029	\$393,759	\$393,759	122.729	\$483,257	\$19,185
5	Debentures	UP Corp.	81	907818BY3	7.125%	2/1/2028	\$173,613	\$173,613	123.486	\$214,387	\$8,854
6	Notes	UP Corp.	82	907818EA2	1.800%	2/1/2020	\$249,456	\$249,456	98.444	\$245,574	\$7,073
7	Notes	UP Corp.	83	907818EE4	2.250%	6/19/2020	\$399,030	\$399,030	98.839	\$394,396	\$11,477
8	Notes	UP Corp.	84	907818DN5	2.750%	4/15/2023	\$322,958	\$322,958	97.542	\$315,019	\$10,490
9	Notes	UP Corp.	85	907818EH7	2.750%	3/1/2026	\$647,332	\$647,332	94.007	\$608,537	\$22,333
10	Notes	UP Corp.	86	907818DM7	2.950%	1/15/2023	\$298,982	\$298,982	98.502	\$294,503	\$9,807
11	Notes	UP Corp.	87	907818EP9	3.000%	4/15/2027	\$490,805	\$490,805	95.211	\$467,300	\$17,056
12	Notes	UP Corp. (New)	88	907818ET1	3.200%	6/8/2021	\$597,370	\$348,466	100.023	\$348,546	\$11,119
13	Notes	UP Corp.	89	907818DY1	3.250%	1/15/2025	\$347,674	\$347,674	98.149	\$341,238	\$12,216
14	Notes	UP Corp.	90	907818ED6	3.250%	8/15/2025	\$498,924	\$498,924	97.810	\$487,999	\$17,617
15	Notes	UP Corp.	91	907818EK0	3.350%	8/15/2046	\$296,022	\$296,022	86.007	\$254,599	\$10,719
16	Notes	UP Corp.	92	907818EB0	3.375%	2/1/2035	\$445,027	\$445,027	91.679	\$407,995	\$16,646
17	Notes	UP Corp. (New)	93	907818EU8	3.500%	6/8/2023	\$645,268	\$376,406	100.040	\$376,557	\$13,142
18	Notes	UP Corp.	94	907818EQ7	3.600%	9/15/2037	\$494,758	\$494,758	93.060	\$460,421	\$19,061
19	Notes	UP Corp.	95	907818DR6	3.646%	2/15/2024	\$385,048	\$385,048	100.975	\$388,800	\$13,452
20	Notes	UP Corp.	96	907818DV7	3.750%	3/15/2024	\$396,589	\$396,589	101.425	\$402,241	\$13,998
21	Notes	UP Corp. (New)	97	907818ES3	3.750%	7/15/2025	\$496,514	\$289,633	100.194	\$290,195	\$10,795
22	Notes	UP Corp.	98	907818EM6	3.799%	10/1/2051	\$696,384	\$696,384	90.456	\$629,920	\$27,465
23	Notes	UP Corp.	99	907818EC8	3.875%	2/1/2055	\$443,913	\$443,913	90.119	\$400,048	\$17,722
24	Notes	UP Corp.	100	907818EY0	3.950%	9/10/2028	\$1,485,514	\$866,550	100.075	\$867,196	\$34,168
25	Notes	UP Corp.	101	907818DG0	4.000%	2/1/2021	\$498,543	\$498,543	102.235	\$509,684	\$15,800
26	Notes	UP Corp.	102	907818EN4	4.000%	4/15/2047	\$488,647	\$488,647	96.503	\$471,561	\$19,900
27	Notes	UP Corp.	103	907818EF1	4.050%	11/15/2045	\$489,769	\$489,769	96.598	\$473,107	\$20,202
28	Notes	UP Corp.	104	907818EJ3	4.050%	3/1/2046	\$586,841	\$586,841	96.647	\$567,164	\$24,218
29	Notes	UP Corp.	105	907818ER5	4.100%	9/15/2067	\$494,315	\$494,315	87.388	\$431,972	\$20,605
30	Notes	UP Corp.	106	907818DZ8	4.150%	1/15/2045	\$341,962	\$341,962	98.007	\$335,146	\$14,378
31	Notes	UP Corp.	107	907818DK1	4.163%	7/15/2022	\$682,420	\$682,420	103.388	\$705,543	\$23,001
32	Notes	UP Corp.	108	907818DP0	4.250%	4/15/2043	\$318,109	\$318,109	99.509	\$316,545	\$13,580
33	Notes	UP Corp.	109	907818DL9	4.300%	6/15/2042	\$297,129	\$297,129	100.360	\$298,199	\$12,763
34	Notes	UP Corp. (New)	110	907818EV6	4.375%	9/10/2038	\$741,555	\$432,574	100.355	\$434,109	\$18,884
35	Notes	UP Corp.	111	907818EG9	4.375%	11/15/2065	\$569,095	\$569,095	92.353	\$525,574	\$25,175
36	Notes	UP Corp. (New)	112	907818EW4	4.500%	9/10/2048	\$1,483,829	\$865,567	100.566	\$870,464	\$38,910
37	Notes	UP Corp.	113	907818DJ4	4.750%	9/15/2041	\$316,326	\$316,326	106.253	\$336,105	\$14,553
38	Notes	UP Corp.	114	907818DU9	4.750%	12/15/2043	\$292,983	\$292,983	105.975	\$310,490	\$13,568
39	Notes	UP Corp. (New)	115	907818EX2	4.800%	9/10/2058	\$494,501	\$288,459	102.122	\$294,580	\$13,786
40	Notes	UP Corp.	116	907818DT2	4.821%	2/1/2044	\$222,403	\$222,403	107.385	\$238,827	\$10,389
41	Notes	UP Corp.	117	907818DX3	4.850%	6/15/2044	\$143,885	\$143,885	106.066	\$152,612	\$6,807
42	Notes	UP Corp.	118	907818DF2	5.780%	7/15/2040	\$63,193	\$63,193	118.655	\$74,982	\$3,329
43	Notes	UP Corp. 144A	119	907818DE5	5.780%	7/15/2040	\$10	\$10	120.712	\$12	\$1
44	Notes	UP Corp.	120	907818DD7	6.125%	2/15/2020	\$162,264	\$162,264	104.748	\$169,968	\$5,184
45	Notes	UP Corp. Series B	121	90782ECK8	9.300%	1/17/2020	\$310	\$310	107.253	\$332	\$14
46	Notes	UP Corp. Series C	122	90782EDE1	9.940%	4/1/2020	\$4,100	\$4,100	109.434	\$4,487	\$188
47	Notes	UP Corp. Series C	123	90782ECU6	10.000%	4/10/2020	\$2,500	\$2,500	109.509	\$2,738	\$117
48	Notes	UP Corp. Series C	124	90782EDG6	9.900%	4/15/2020	\$250	\$250	109.216	\$273	\$12
49	Notes	UP Corp. Series C	125	90782EDJ0	9.900%	4/15/2020	\$525	\$525	109.216	\$573	\$25
50											
Total							\$19,367,608	\$16,890,712		\$16,757,492	\$663,553

Union Pacific Corporation
12/31/2018

Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
						Year-End	Used				
Trading Data Not Available or Did Not Trade											
1											
2											
3											
4											
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25											
26											
27											
28											
29											
30											
Total						\$0	\$0		\$0		

Union Pacific Corporation
12/31/2018

Maturities												
Type		Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding (\$000)		Average Price	Market Value (\$ 000)	Average Yield	Interest Cost (\$ 000)
							Year-End	Used				
Matures in 2019												
1	Debentures	UP Corp.		907818DW5	2.250%	2/15/2019	299,913					
2	Notes	UP Corp.		907818DB1	7.875%	1/15/2019	158,515					
3	Debt Security	Illinois DOT SPCSL			3.000%	12/31/2019	1,664					
4												
5												
6												
7												
8												
9												
10												
Total							\$460,092					

Grand Totals

Total Traded and Trading Data Not Available **\$19,367,608 \$16,890,712 \$16,757,492**

Grand Total (for reconciliation to carrier data only) **\$19,827,700**

From UNP:

Corporate Debentures, Notes, Floating Rate Loans, and Commercial Paper	\$20,275,972			
Removal of Floating Rate Loans & Commercial Paper	-449,936	150,000	100,000	199,936
UP RR Debt Securities Outstanding	401,445			
Removal of unamortized SOR Fees	219			
Removal of Sale of Receivables	-400,000			
Total	\$19,827,700			

CSX Corporation		
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1	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GT4
	Coupon Rate:	3.700%
	Maturity Date:	10/30/2020
	Amount Outstanding (\$ 000)	\$500,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	102.850	2.62 %
February	102.196	2.84
March	101.828	2.96
April	101.390	3.12
May	101.454	3.07
June	101.115	3.20
July	101.171	3.15
August	101.130	3.15
September	101.015	3.19
October	100.589	3.39
November	100.474	3.44
December	100.946	3.16
Average	101.347	3.11 %

Source: Bloomberg

CSX Corporation		
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2	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	12641LBD4
	Coupon Rate:	9.870%
	Maturity Date:	2/12/2021
	Amount Outstanding (\$ 000)	\$10,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	117.175	3.81 %
February	116.102	4.02
March	115.385	4.11
April	114.496	4.28
May	114.212	4.22
June	113.559	4.31
July	113.039	4.37
August	112.830	4.27
September	112.204	4.37
October	111.605	4.45
November	111.054	4.50
December	111.284	4.22
Average	113.579	4.24 %

Source: Bloomberg

CSX Corporation		
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3	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GV9
	Coupon Rate:	4.250%
	Maturity Date:	6/1/2021
	Amount Outstanding (\$ 000)	\$350,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	104.242	2.90 %
February	103.431	3.13
March	103.329	3.13
April	102.743	3.31
May	102.840	3.25
June	102.538	3.33
July	102.348	3.37
August	102.433	3.31
September	102.113	3.41
October	101.900	3.47
November	101.575	3.58
December	102.294	3.25
Average	102.649	3.29 %

Source: Bloomberg

CSX Corporation		
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4	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408AQ6
	Coupon Rate:	8.100%
	Maturity Date:	9/15/2022
	Amount Outstanding (\$ 000)	\$69,081
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	119.939	3.40 %
February	117.919	3.77
March	117.409	3.81
April	116.485	3.95
May	116.363	3.91
June	115.532	4.04
July	114.103	4.32
August	114.233	4.22
September	113.458	4.36
October	112.752	4.47
November	112.632	4.43
December	113.238	4.20
Average	115.339	4.07 %

Source: Bloomberg

CSX Corporation		
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5	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408AM5
	Coupon Rate:	8.625%
	Maturity Date:	5/15/2022
	Amount Outstanding (\$ 000)	\$81,517
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	120.736	3.39 %
February	118.350	3.85
March	118.366	3.77
April	117.451	3.91
May	117.268	3.87
June	116.438	3.99
July	116.112	3.99
August	116.182	3.88
September	115.426	4.00
October	114.753	4.10
November	114.455	4.09
December	114.924	3.85
Average	116.705	3.89 %

Source: Bloomberg

CSX Corporation		
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6	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GZ0
	Coupon Rate:	3.700%
	Maturity Date:	11/1/2023
	Amount Outstanding (\$ 000)	\$500,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	103.114	3.10 %
February	101.851	3.34
March	101.624	3.38
April	100.567	3.59
May	100.723	3.55
June	100.570	3.58
July	100.623	3.57
August	101.429	3.40
September	100.787	3.53
October	100.262	3.64
November	100.700	3.54
December	101.540	3.35
Average	101.149	3.46 %

Source: Bloomberg

CSX Corporation		
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7	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HB2
	Coupon Rate:	3.400%
	Maturity Date:	8/1/2024
	Amount Outstanding (\$ 000)	\$550,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.361	3.17 %
February	99.819	3.43
March	99.923	3.41
April	98.430	3.68
May	98.673	3.64
June	98.339	3.71
July	98.579	3.67
August	99.366	3.52
September	98.712	3.65
October	98.216	3.75
November	98.409	3.71
December	99.554	3.49
Average	99.115	3.57 %

Source: Bloomberg

CSX Corporation		
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8	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HD8
	Coupon Rate:	3.350%
	Maturity Date:	11/1/2025
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	100.237	3.32 %
February	98.047	3.64
March	97.854	3.68
April	96.900	3.83
May	96.957	3.83
June	96.435	3.91
July	97.408	3.76
August	97.899	3.69
September	97.275	3.79
October	95.948	4.02
November	96.239	3.98
December	97.082	3.84
Average	97.357	3.77 %

Source: Bloomberg

CSX Corporation		
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9	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HE6
	Coupon Rate:	2.600%
	Maturity Date:	11/1/2026
	Amount Outstanding (\$ 000)	\$700,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	93.754	3.43 %
February	91.640	3.74
March	91.531	3.76
April	90.648	3.90
May	90.633	3.92
June	90.225	3.99
July	91.575	3.80
August	91.811	3.78
September	91.088	3.90
October	89.675	4.13
November	89.437	4.18
December	90.776	3.98
Average	91.066	3.88 %

Source: Bloomberg

CSX Corporation		
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10	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408BP7
	Coupon Rate:	7.250%
	Maturity Date:	5/1/2027
	Amount Outstanding (\$ 000)	\$83,312
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	123.828	4.12 %
February	120.611	4.48
March	120.449	4.48
April	119.167	4.62
May	120.190	4.48
June	119.715	4.52
July	120.331	4.42
August	121.035	4.31
September	119.990	4.42
October	118.914	4.54
November	116.168	4.88
December	117.146	4.73
Average	119.795	4.50 %

Source: Bloomberg

CSX Corporation		
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11	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408BM4
	Coupon Rate:	7.950%
	Maturity Date:	5/1/2027
	Amount Outstanding (\$ 000)	\$64,266
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	126.255	4.45 %
February	122.234	4.91
March	122.050	4.91
April	125.274	4.50
May	125.129	4.50
June	124.203	4.58
July	124.247	4.56
August	124.836	4.46
September	123.686	4.58
October	122.516	4.71
November	120.788	4.90
December	121.725	4.76
Average	123.579	4.65 %

Source: Bloomberg

CSX Corporation		
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12	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HH9
	Coupon Rate:	3.250%
	Maturity Date:	6/1/2027
	Amount Outstanding (\$ 000)	\$850,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.324	3.46 %
February	95.638	3.81
March	95.605	3.82
April	94.630	3.96
May	94.900	3.93
June	94.031	4.06
July	95.339	3.88
August	95.332	3.89
September	94.824	3.96
October	93.345	4.18
November	93.514	4.17
December	94.645	4.01
Average	95.011	3.93 %

Source: Bloomberg

CSX Corporation		
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13	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	12641LBU6
	Coupon Rate:	6.800%
	Maturity Date:	12/1/2028
	Amount Outstanding (\$ 000)	\$200,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	124.133	4.03 %
February	119.103	4.53
March	119.022	4.53
April	120.392	4.37
May	120.844	4.31
June	119.925	4.39
July	119.891	4.38
August	120.774	4.27
September	119.553	4.39
October	118.221	4.53
November	116.689	4.69
December	117.562	4.58
Average	119.676	4.42 %

Source: Bloomberg

CSX Corporation		
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14	Type:	Notes (New)
	Description:	CSX Corp.
	CUSIP:	126408HJ5
	Coupon Rate:	3.800%
	Maturity Date:	3/1/2028
	Amount Outstanding (\$ 000)	\$800,000
	Months Outstanding	10.5

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	99.716	3.83
March	99.660	3.84
April	98.522	3.98
May	98.660	3.97
June	97.737	4.09
July	98.867	3.94
August	99.710	3.84
September	98.680	3.97
October	96.530	4.25
November	97.052	4.19
December	98.299	4.02
Average	98.494	3.99 %

Source: Bloomberg

Prospectus dated February 15, 2018

Interest accrues from February 20, 2018

CSX Corporation		
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15	Type:	Notes (New)
	Description:	CSX Corp.
	CUSIP:	126408HM8
	Coupon Rate:	4.250%
	Maturity Date:	3/15/2029
	Amount Outstanding (\$ 000)	\$350,000
	Months Outstanding	1.5

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	Not Traded	-
August	Not Traded	-
September	Not Traded	-
October	Not Traded	-
November	100.546	4.18
December	101.814	4.03
Average	101.180	4.11 %

Source: Bloomberg

Issued 11/15/2018

Interest accrues from November 15, 2018

CSX Corporation		
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16	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GH0
	Coupon Rate:	6.000%
	Maturity Date:	10/1/2036
	Amount Outstanding (\$ 000)	\$400,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	126.871	3.95 %
February	122.487	4.24
March	122.711	4.22
April	120.046	4.40
May	120.565	4.36
June	118.688	4.49
July	120.011	4.39
August	119.116	4.45
September	118.516	4.49
October	114.574	4.78
November	114.751	4.76
December	116.595	4.62
Average	119.578	4.43 %

Source: Bloomberg

CSX Corporation		
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17	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GK3
	Coupon Rate:	6.150%
	Maturity Date:	5/1/2037
	Amount Outstanding (\$ 000)	\$700,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	129.100	3.97 %
February	124.520	4.26
March	123.818	4.31
April	121.847	4.44
May	122.387	4.39
June	120.505	4.52
July	121.138	4.47
August	121.222	4.46
September	119.864	4.55
October	116.475	4.80
November	117.158	4.74
December	118.277	4.66
Average	121.359	4.46 %

Source: Bloomberg

CSX Corporation		
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18	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GP2
	Coupon Rate:	7.450%
	Maturity Date:	4/1/2038
	Amount Outstanding (\$ 000)	\$79,226
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	133.638	4.82 %
February	132.251	4.91
March	133.563	4.82
April	131.646	4.94
May	131.108	4.97
June	130.201	5.02
July	130.192	5.02
August	131.094	4.95
September	129.027	5.09
October	126.894	5.23
November	124.911	5.36
December	126.005	5.28
Average	130.044	5.03 %

Source: Bloomberg

CSX Corporation		
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19	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GS6
	Coupon Rate:	6.220%
	Maturity Date:	4/30/2040
	Amount Outstanding (\$ 000)	\$660,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	131.505	4.06 %
February	125.238	4.42
March	125.918	4.38
April	123.454	4.53
May	123.648	4.51
June	121.426	4.65
July	123.919	4.49
August	123.394	4.52
September	120.832	4.68
October	117.149	4.92
November	117.412	4.90
December	119.325	4.77
Average	122.768	4.57 %

Source: Bloomberg

CSX Corporation		
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20	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GU1
	Coupon Rate:	5.500%
	Maturity Date:	4/15/2041
	Amount Outstanding (\$ 000)	\$550,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	121.142	4.08 %
February	116.246	4.38
March	116.652	4.35
April	113.169	4.57
May	113.799	4.53
June	111.663	4.66
July	114.141	4.50
August	113.608	4.53
September	112.879	4.58
October	107.681	4.93
November	107.976	4.91
December	110.724	4.72
Average	113.307	4.56 %

Source: Bloomberg

\$300,000	}	same CUSIP
<u>250,000</u>		
\$550,000		

CSX Corporation		
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21	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GW7
	Coupon Rate:	4.750%
	Maturity Date:	5/30/2042
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	111.631	4.00 %
February	106.367	4.32
March	106.669	4.30
April	104.152	4.47
May	103.852	4.49
June	102.302	4.59
July	104.706	4.43
August	104.047	4.47
September	103.613	4.50
October	99.348	4.80
November	99.350	4.80
December	101.235	4.66
Average	103.939	4.49 %

Source: Bloomberg

CSX Corporation		
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22	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GX5
	Coupon Rate:	4.400%
	Maturity Date:	3/1/2043
	Amount Outstanding (\$ 000)	\$300,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	106.237	4.00 %
February	100.659	4.36
March	101.387	4.31
April	99.548	4.43
May	98.877	4.48
June	97.835	4.55
July	99.661	4.42
August	99.867	4.41
September	98.792	4.48
October	94.668	4.77
November	94.830	4.76
December	97.086	4.60
Average	99.121	4.46 %

Source: Bloomberg

CSX Corporation		
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23	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408GY3
	Coupon Rate:	4.100%
	Maturity Date:	3/15/2044
	Amount Outstanding (\$ 000)	\$800,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	102.877	3.92 %
February	96.119	4.35
March	97.230	4.28
April	94.796	4.44
May	94.273	4.48
June	93.671	4.52
July	95.469	4.40
August	95.493	4.40
September	94.885	4.44
October	90.680	4.74
November	90.785	4.73
December	93.444	4.54
Average	94.977	4.44 %

Source: Bloomberg

CSX Corporation		
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24	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HF3
	Coupon Rate:	3.800%
	Maturity Date:	11/1/2046
	Amount Outstanding (\$ 000)	\$800,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.110	3.91 %
February	91.360	4.33
March	92.141	4.28
April	90.151	4.41
May	89.942	4.43
June	88.392	4.53
July	91.670	4.31
August	91.091	4.35
September	90.698	4.38
October	86.192	4.69
November	86.311	4.68
December	89.091	4.49
Average	90.429	4.40 %

Source: Bloomberg

CSX Corporation		
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25	Type:	Notes (New)
	Description:	CSX Corp.
	CUSIP:	126408HK2
	Coupon Rate:	4.300%
	Maturity Date:	3/1/2048
	Amount Outstanding (\$ 000)	\$850,000
	Months Outstanding	10.5

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	99.009	4.36
March	100.001	4.30
April	97.309	4.46
May	97.031	4.48
June	95.325	4.59
July	98.961	4.36
August	97.770	4.44
September	97.301	4.47
October	92.482	4.78
November	92.960	4.75
December	96.000	4.55
Average	96.741	4.50 %

Source: Bloomberg

Issued February 20, 2018 Prospectus dated February 15, 2018
Interest accrues from February 20, 2018

CSX Corporation		
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26	Type:	Notes (New)
	Description:	CSX Corp.
	CUSIP:	126408HN6
	Coupon Rate:	4.750%
	Maturity Date:	11/15/2048
	Amount Outstanding (\$ 000)	\$650,000
	Months Outstanding	1.5

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	Not Traded	-
August	Not Traded	-
September	Not Traded	-
October	Not Traded	-
November	99.169	4.80
December	101.948	4.63
Average	100.559	4.72 %

Source: Bloomberg

Issued November 15, 2018

CSX Corporation		
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27	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HC0
	Coupon Rate:	3.950%
	Maturity Date:	5/1/2050
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.275	4.05 %
February	92.762	4.37
March	92.365	4.40
April	89.771	4.56
May	89.984	4.55
June	88.479	4.65
July	91.026	4.48
August	91.441	4.46
September	90.598	4.51
October	85.629	4.84
November	86.617	4.78
December	88.689	4.64
Average	90.470	4.52 %

Source: Bloomberg

CSX Corporation		
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28	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HA4
	Coupon Rate:	4.500%
	Maturity Date:	8/1/2054
	Amount Outstanding (\$ 000)	\$450,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	104.875	4.24 %
February	98.414	4.59
March	99.307	4.54
April	97.140	4.66
May	96.514	4.70
June	95.147	4.78
July	98.995	4.56
August	98.593	4.58
September	96.542	4.70
October	92.532	4.95
November	92.454	4.95
December	94.934	4.80
Average	97.121	4.67 %

Source: Bloomberg

CSX Corporation		
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29	Type:	Notes
	Description:	CSX Corp.
	CUSIP:	126408HG1
	Coupon Rate:	4.250%
	Maturity Date:	11/1/2066
	Amount Outstanding (\$ 000)	\$700,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	88.669	4.86
May	88.507	4.87
June	86.987	4.96
July	89.674	4.80
August	90.396	4.76
September	90.386	4.76
October	85.226	5.07
November	85.457	5.06
December	87.202	4.95
Average	88.056	4.90 %

Source: Bloomberg

CSX Corporation		
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30	Type:	Notes (New)
	Description:	CSX Corp.
	CUSIP:	126408HL0
	Coupon Rate:	4.650%
	Maturity Date:	3/1/2068
	Amount Outstanding (\$ 000)	\$350,000
	Months Outstanding	10.5

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	95.031	4.92
May	95.167	4.91
June	93.393	5.01
July	96.428	4.84
August	97.137	4.80
September	96.558	4.83
October	91.181	5.14
November	91.553	5.12
December	92.699	5.05
Average	94.350	4.96 %

Source: Bloomberg

Prospectus dated February 15, 2018, issued February 20, 2018
Interest accrues from February 20, 2018

CSX Corporation		
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31	Type:	Notes
	Description:	CSXT - Conrail
	CUSIP:	126410LK3
	Coupon Rate:	9.750%
	Maturity Date:	6/15/2020
	Amount Outstanding (\$ 000)	\$227,171
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	115.754	2.83 %
February	114.814	2.99
March	114.254	3.00
April	113.250	3.23
May	112.846	3.17
June	111.964	3.36
July	111.469	3.37
August	111.095	3.27
September	110.462	3.37
October	109.815	3.46
November	109.344	3.43
December	109.309	3.13
Average	112.031	3.22 %

Source: Bloomberg

CSX Corporation		
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32	Type:	Notes
	Description:	CSXT - Conrail
	CUSIP:	126410LL1
	Coupon Rate:	7.875%
	Maturity Date:	5/15/2043
	Amount Outstanding (\$ 000)	\$99,989
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	150.605	4.50 %
February	143.394	4.87
March	143.413	4.86
April	141.282	4.97
May	141.326	4.97
June	140.263	5.02
July	143.489	4.84
August	141.058	4.97
September	137.037	5.19
October	134.781	5.32
November	135.365	5.28
December	138.787	5.08
Average	140.900	4.99 %

Source: Bloomberg

CSX Corporation		
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33	Type:	Sec'd Eq Notes
	Description:	CSXT
	CUSIP:	126410LM9
	Coupon Rate:	6.251%
	Maturity Date:	1/15/2023
	Amount Outstanding (\$ 000)	\$195,852
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	111.828	3.62 %
February	110.951	3.77
March	110.003	3.94
April	108.734	4.18
May	108.684	4.16
June	108.225	4.24
July	108.220	4.21
August	109.442	3.88
September	108.097	4.17
October	107.774	4.21
November	107.460	4.25
December	107.767	4.14
Average	108.932	4.06 %

Source: Bloomberg

Kansas City Southern Corp.		
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34	Type:	Sr Note
	Description:	KCSR
	CUSIP:	485188AN6
	Coupon Rate:	4.300%
	Maturity Date:	5/15/2043
	Amount Outstanding (\$ 000)	\$1,179
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	100.425	4.27 %
February	97.397	4.47
March	93.252	4.76
April	90.691	4.95
May	89.232	5.07
June	92.538	4.82
July	93.937	4.72
August	94.504	4.68
September	94.339	4.69
October	91.313	4.91
November	91.762	4.88
December	94.175	4.70
Average	93.630	4.74 %

Source: Bloomberg

Kansas City Southern Corp.		
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35	Type:	Sr Note
	Description:	KCSR
	CUSIP:	485188AM8
	Coupon Rate:	3.850%
	Maturity Date:	11/15/2023
	Amount Outstanding (\$ 000)	\$776
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	97.932	4.26 %
February	97.087	4.43
March	98.725	4.11
April	97.634	4.34
May	98.001	4.27
June	97.819	4.31
July	97.495	4.39
August	98.344	4.21
September	98.050	4.28
October	96.899	4.55
November	97.992	4.31
December	98.788	4.13
Average	97.897	4.30 %

Source: Bloomberg

Kansas City Southern Corp.		
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36	Type:	Sr Note
	Description:	KCSR
	CUSIP:	485188AP1
	Coupon Rate:	4.950%
	Maturity Date:	8/15/2045
	Amount Outstanding (\$ 000)	\$792
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	94.498	5.33 %
February	92.134	5.51
March	92.681	5.47
April	90.206	5.66
May	88.419	5.80
June	101.501	4.85
July	102.463	4.79
August	103.231	4.74
September	102.946	4.75
October	99.589	4.98
November	100.022	4.95
December	103.404	4.72
Average	97.591	5.13 %

Source: Bloomberg

Kansas City Southern Corp.		
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37	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170AF1
	Coupon Rate:	7.000%
	Maturity Date:	12/15/2025
	Amount Outstanding (\$ 000)	\$221
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	112.310	5.08 %
February	111.079	5.25
March	111.413	5.18
April	109.839	5.41
May	109.818	5.40
June	108.703	5.56
July	108.854	5.52
August	109.495	5.40
September	108.773	5.51
October	108.237	5.58
November	108.476	5.53
December	109.934	5.27
Average	109.744	5.39 %

Source: Bloomberg

Kansas City Southern Corp.		
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38	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170AQ7
	Coupon Rate:	4.300%
	Maturity Date:	5/15/2043
	Amount Outstanding (\$ 000)	\$448,651
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.546	4.20 %
February	98.309	4.41
March	100.285	4.28
April	94.797	4.65
May	95.005	4.64
June	93.254	4.77
July	93.827	4.73
August	95.336	4.62
September	93.710	4.74
October	92.938	4.79
November	94.526	4.68
December	97.481	4.47
Average	95.918	4.58 %

Source: Bloomberg

Kansas City Southern Corp.		
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39	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170AR5
	Coupon Rate:	3.850%
	Maturity Date:	11/15/2023
	Amount Outstanding (\$ 000)	\$199,224
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	100.164	3.82 %
February	99.227	4.00
March	99.995	3.85
April	98.803	4.09
May	98.655	4.13
June	98.050	4.26
July	97.699	4.34
August	98.185	4.24
September	98.676	4.14
October	98.475	4.19
November	98.996	4.08
December	100.373	3.77
Average	98.942	4.08 %

Source: Bloomberg

Kansas City Southern Corp.		
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40	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170AS3
	Coupon Rate:	4.950%
	Maturity Date:	8/15/2045
	Amount Outstanding (\$ 000)	\$499,165
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	111.174	4.26 %
February	107.538	4.47
March	108.543	4.41
April	106.452	4.54
May	103.295	4.73
June	102.550	4.78
July	102.006	4.82
August	104.107	4.68
September	103.031	4.75
October	99.692	4.97
November	100.545	4.91
December	101.854	4.83
Average	104.232	4.68 %

Source: Bloomberg

Kansas City Southern Corp.		
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41	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170AU8
	Coupon Rate:	2.350%
	Maturity Date:	5/15/2020
	Amount Outstanding (\$ 000)	\$257,346
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	99.187	2.72 %
February	98.715	2.96
March	98.721	2.98
April	98.365	3.19
May	98.535	3.13
June	98.233	3.33
July	98.160	3.42
August	98.362	3.35
September	98.190	3.51
October	98.151	3.60
November	98.289	3.57
December	98.954	3.14
Average	98.489	3.24 %

Source: Bloomberg

Kansas City Southern Corp.		
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42	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170AV6
	Coupon Rate:	3.000%
	Maturity Date:	5/15/2023
	Amount Outstanding (\$ 000)	\$439,123
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.070	3.40 %
February	97.163	3.60
March	97.662	3.50
April	96.160	3.85
May	96.381	3.81
June	95.747	3.97
July	96.068	3.91
August	96.669	3.78
September	96.411	3.86
October	96.072	3.95
November	96.694	3.82
December	97.526	3.62
Average	96.719	3.76 %

Source: Bloomberg

Kansas City Southern Corp.		
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43	Type:	Sr Note
	Description:	KCS
	CUSIP:	485170BA1
	Coupon Rate:	3.125%
	Maturity Date:	6/1/2026
	Amount Outstanding (\$ 000)	\$250,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	94.953	3.84 %
February	94.074	3.97
March	94.198	3.96
April	93.250	4.12
May	92.921	4.18
June	92.244	4.29
July	92.034	4.34
August	92.974	4.20
September	92.184	4.33
October	91.756	4.42
November	92.271	4.35
December	94.057	4.06
Average	93.076	4.17 %

Source: Bloomberg

Kansas City Southern Corp.		
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44	Type:	Sr Note (New)
	Description:	KCS
	CUSIP:	485170BB9
	Coupon Rate:	4.700%
	Maturity Date:	5/1/2048
	Amount Outstanding (\$ 000)	\$500,000
	Months Outstanding	8.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	98.598	4.79
June	96.806	4.91
July	99.532	4.73
August	100.505	4.67
September	99.873	4.71
October	96.630	4.92
November	97.093	4.89
December	98.364	4.80
Average	98.425	4.80 %

Source: Bloomberg

Prospectus supplement dated April 30, 2018.

Interest accrues from May 3, 2018.

Kansas City Southern Corp.		
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45	Type:	Sr Note
	Description:	KCSM
	CUSIP:	485161AQ6
	Coupon Rate:	2.350%
	Maturity Date:	5/15/2020
	Amount Outstanding (\$ 000)	\$17,594
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	97.811	3.35 %
February	97.696	3.44
March	97.868	3.40
April	97.385	3.70
May	97.598	3.64
June	97.045	4.01
July	97.156	4.01
August	97.688	3.77
September	97.452	3.99
October	97.537	4.02
November	97.190	4.37
December	97.760	4.05
Average	97.516	3.81 %

Source: Bloomberg

Kansas City Southern Corp.		
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46	Type:	Sr Note
	Description:	KCSM
	CUSIP:	485161AS2
	Coupon Rate:	3.000%
	Maturity Date:	5/15/2023
	Amount Outstanding (\$ 000)	\$5,560
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	95.837	3.88 %
February	94.167	4.26
March	95.335	4.02
April	94.389	4.25
May	95.006	4.13
June	94.594	4.24
July	93.966	4.41
August	94.806	4.23
September	94.317	4.37
October	93.829	4.52
November	94.390	4.40
December	95.714	4.08
Average	94.696	4.23 %

Source: Bloomberg

Norfolk Southern Corp.

47	Type:	Debenture
	Description:	Southern Railway
	CUSIP:	655855FA7
	Coupon Rate:	9.750%
	Maturity Date:	6/15/2020
	Amount Outstanding (\$ 000)	\$313,741
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	115.979	2.74 %
February	115.122	2.87
March	114.434	2.92
April	113.565	3.09
May	113.223	2.99
June	112.495	3.10
July	111.839	3.17
August	111.252	3.18
September	110.394	3.41
October	109.834	3.45
November	109.589	3.27
December	109.314	3.13
Average	112.253	3.11 %

Source: Bloomberg

Norfolk Southern Corp.

48	Type:	Debenture
	Description:	Southern Railway
	CUSIP:	655855FB5
	Coupon Rate:	7.875%
	Maturity Date:	5/15/2043
	Amount Outstanding (\$ 000)	\$138,085
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	153.875	4.34 %
February	149.597	4.55
March	148.909	4.58
April	145.791	4.73
May	147.807	4.63
June	145.630	4.73
July	144.828	4.77
August	145.265	4.74
September	140.957	4.97
October	137.559	5.16
November	138.732	5.09
December	143.797	4.81
Average	145.229	4.76 %

Source: Bloomberg

Norfolk Southern Corp.

49	Type:	Notes
	Description:	Series A NSC
	CUSIP:	655844AA6
	Coupon Rate:	9.000%
	Maturity Date:	3/1/2021
	Amount Outstanding (\$ 000)	\$83,372
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	116.121	3.44 %
February	115.607	3.47
March	114.774	3.61
April	113.971	3.75
May	114.067	3.57
June	113.397	3.67
July	112.721	3.78
August	112.640	3.64
September	111.804	3.83
October	110.397	4.26
November	110.921	3.86
December	111.120	3.60
Average	113.128	3.71 %

Source: Bloomberg

Norfolk Southern Corp.

50	Type:	Notes
	Description:	Senior
	CUSIP:	655844AQ1
	Coupon Rate:	7.250%
	Maturity Date:	2/15/2031
	Amount Outstanding (\$ 000)	\$284,028
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	138.759	3.52 %
February	135.128	3.79
March	135.160	3.77
April	132.501	3.98
May	133.603	3.87
June	132.778	3.93
July	132.022	3.98
August	133.150	3.87
September	128.602	4.25
October	127.570	4.33
November	126.292	4.44
December	127.258	4.33
Average	131.902	4.01 %

Source: Bloomberg

Norfolk Southern Corp.

51	Type:	Notes
	Description:	Senior
	CUSIP:	655844BG2
	Coupon Rate:	3.250%
	Maturity Date:	12/1/2021
	Amount Outstanding (\$ 000)	\$500,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.462	2.84 %
February	100.864	3.00
March	100.527	3.10
April	99.928	3.27
May	100.266	3.17
June	99.841	3.30
July	99.633	3.37
August	99.950	3.27
September	99.558	3.40
October	99.339	3.48
November	99.510	3.42
December	100.329	3.13
Average	100.101	3.23 %

Source: Bloomberg

Norfolk Southern Corp.		
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52	Type:	Notes
	Description:	Senior
	CUSIP:	655844BJ6
	Coupon Rate:	3.000%
	Maturity Date:	4/1/2022
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	100.453	2.88 %
February	99.641	3.09
March	99.504	3.13
April	98.903	3.30
May	99.069	3.26
June	98.903	3.31
July	98.781	3.36
August	99.023	3.29
September	98.472	3.47
October	98.586	3.44
November	98.509	3.48
December	99.467	3.17
Average	99.109	3.27 %

Source: Bloomberg

Norfolk Southern Corp.

53	Type:	Notes
	Description:	Senior
	CUSIP:	655844BL1
	Coupon Rate:	2.903%
	Maturity Date:	2/15/2023
	Amount Outstanding (\$ 000)	\$596,450
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	99.230	3.07 %
February	98.591	3.21
March	98.520	3.23
April	97.581	3.46
May	98.223	3.31
June	97.985	3.38
July	97.752	3.44
August	98.115	3.36
September	97.515	3.52
October	97.016	3.66
November	97.356	3.59
December	98.528	3.29
Average	98.034	3.38 %

Source: Bloomberg

Note: This is the exchange-traded portion of these notes. The Rule 144-A notes similar to these have a different CUSIP, and are shown on the next page.

53	Exchange traded	\$596,450
54	Rule 144-A	3,550
		\$600,000

Norfolk Southern Corp.

54	Type:	Notes
	Description:	Senior 144A
	CUSIP:	655844BK3
	Coupon Rate:	2.903%
	Maturity Date:	2/15/2023
	Amount Outstanding (\$ 000)	\$3,550
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	99.161	3.08 %
February	98.632	3.20
March	98.808	3.17
April	97.569	3.46
May	98.181	3.32
June	97.975	3.38
July	97.711	3.45
August	98.097	3.37
September	97.460	3.54
October	96.996	3.67
November	97.088	3.66
December	98.456	3.31
Average	98.011	3.38 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers and have their own CUSIP. The exchange-traded notes similar to these are on the proceeding page.

53	Exchange traded	\$596,450
54	Rule 144-A	3,550
		\$600,000

Norfolk Southern Corp.

55	Type:	Notes
	Description:	Senior
	CUSIP:	655844BD9
	Coupon Rate:	6.000%
	Maturity Date:	5/23/2111
	Amount Outstanding (\$ 000)	\$121,731
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	133.974	4.46 %
February	125.372	4.77
March	121.990	4.91
April	117.963	5.08
May	119.957	4.99
June	121.550	4.93
July	119.045	5.03
August	119.556	5.01
September	117.413	5.10
October	111.549	5.37
November	112.779	5.32
December	113.627	5.28
Average	119.565	5.02 %

Source: Bloomberg

\$97,602	}	same CUSIP
<u>24,129</u>		
\$121,731		

Norfolk Southern Corp.

56	Type: Notes Description: Senior 2105 CUSIP: 655844AV0 Coupon Rate: 6.000% Maturity Date: 3/15/2105 Amount Outstanding (\$ 000) \$184,118 Months Outstanding 12.0
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End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	113.861	5.26
May	114.558	5.23
June	114.150	5.25
July	113.821	5.26
August	115.469	5.19
September	113.255	5.29
October	106.002	5.66
November	108.652	5.52
December	112.840	5.31
Average	112.512	5.33 %

Source: Bloomberg

Traded during all months of 2017

\$100,428	}	same CUSIP
<u>83,690</u>		
\$184,118		

Norfolk Southern Corp.

57	Type: Description: CUSIP: Coupon Rate: Maturity Date: Amount Outstanding (\$ 000) Months Outstanding	Notes Senior 655844AX6 5.640% 5/17/2029 \$210,316 12.0
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End of Month in 2018	Price	Yield
January	115.588	3.92 %
February	113.598	4.11
March	113.695	4.09
April	111.746	4.29
May	112.528	4.20
June	111.937	4.26
July	111.624	4.28
August	112.445	4.18
September	110.686	4.37
October	110.007	4.44
November	111.000	4.32
December	112.212	4.18
Average	112.256	4.22 %

Source: Bloomberg

Norfolk Southern Corp.

58	Type: Description: CUSIP: Coupon Rate: Maturity Date: Amount Outstanding (\$ 000) Months Outstanding	Notes Senior 655844AW8 5.590% 5/17/2025 \$251,172 12.0
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End of Month in 2018	Price	Yield
January	113.393	3.49 %
February	111.923	3.69
March	111.727	3.70
April	110.445	3.88
May	110.740	3.82
June	109.658	3.97
July	109.693	3.95
August	110.531	3.79
September	109.275	3.98
October	109.252	3.97
November	109.642	3.89
December	110.671	3.69
Average	110.579	3.82 %

Source: Bloomberg

Norfolk Southern Corp.

59	Type:	Notes
	Description:	Senior
	CUSIP:	655844BH0
	Coupon Rate:	4.837%
	Maturity Date:	10/1/2041
	Amount Outstanding (\$ 000)	\$595,504
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	113.264	3.97 %
February	109.429	4.20
March	109.309	4.21
April	106.828	4.37
May	106.847	4.37
June	105.034	4.49
July	106.891	4.36
August	106.815	4.37
September	105.135	4.48
October	101.577	4.72
November	102.916	4.63
December	105.916	4.42
Average	106.663	4.38 %

Source: Bloomberg

\$595,502	}	same CUSIP
2		
\$595,504		

Norfolk Southern Corp.

60	Type:	Notes
	Description:	Senior
	CUSIP:	655844BM9
	Coupon Rate:	3.950%
	Maturity Date:	10/1/2042
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.118	3.88 %
February	97.031	4.14
March	97.533	4.11
April	94.922	4.29
May	95.108	4.28
June	93.420	4.39
July	94.865	4.29
August	95.006	4.28
September	93.783	4.37
October	90.235	4.63
November	90.220	4.63
December	92.387	4.47
Average	94.636	4.31 %

Source: Bloomberg

Norfolk Southern Corp.		
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61	Type:	Notes
	Description:	Senior
	CUSIP:	655844BN7
	Coupon Rate:	4.800%
	Maturity Date:	8/15/2043
	Amount Outstanding (\$ 000)	\$291,829
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	111.739	4.06 %
February	107.552	4.31
March	107.693	4.30
April	104.732	4.49
May	104.425	4.50
June	103.490	4.57
July	105.477	4.44
August	104.260	4.51
September	103.054	4.59
October	99.055	4.87
November	100.443	4.77
December	102.054	4.66
Average	104.498	4.51 %

Source: Bloomberg

Norfolk Southern Corp.

62	Type:	Notes
	Description:	Senior
	CUSIP:	655844BP2
	Coupon Rate:	3.850%
	Maturity Date:	1/15/2024
	Amount Outstanding (\$ 000)	\$400,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	104.147	3.08 %
February	103.012	3.28
March	102.138	3.44
April	100.981	3.66
May	101.323	3.59
June	101.195	3.61
July	101.233	3.60
August	101.633	3.51
September	101.094	3.62
October	100.458	3.75
November	100.635	3.71
December	101.456	3.53
Average	101.609	3.53 %

Source: Bloomberg

Norfolk Southern Corp.

63	Type:	Notes
	Description:	Senior
	CUSIP:	655844BQ0
	Coupon Rate:	4.450%
	Maturity Date:	6/15/2045
	Amount Outstanding (\$ 000)	\$500,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	108.779	3.92 %
February	103.882	4.21
March	104.103	4.20
April	101.348	4.36
May	101.859	4.33
June	100.318	4.43
July	102.279	4.31
August	101.944	4.33
September	100.746	4.40
October	96.011	4.71
November	96.200	4.70
December	98.908	4.52
Average	101.365	4.37 %

Source: Bloomberg

Norfolk Southern Corp.		
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64	Type:	Notes
	Description:	Senior
	CUSIP:	655844BR8
	Coupon Rate:	4.650%
	Maturity Date:	1/15/2046
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	112.461	3.91 %
February	107.183	4.21
March	107.168	4.21
April	104.092	4.39
May	104.162	4.39
June	102.722	4.48
July	105.271	4.32
August	104.586	4.36
September	103.503	4.43
October	99.328	4.69
November	99.837	4.66
December	102.159	4.51
Average	104.373	4.38 %

Source: Bloomberg

Norfolk Southern Corp.

65	Type:	Notes
	Description:	Senior
	CUSIP:	655844BS6
	Coupon Rate:	2.900%
	Maturity Date:	6/15/2026
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	96.594	3.37 %
February	94.913	3.62
March	95.166	3.59
April	93.927	3.78
May	94.118	3.76
June	93.583	3.84
July	94.371	3.73
August	94.991	3.65
September	93.929	3.82
October	92.848	4.00
November	93.062	3.98
December	94.280	3.79
Average	94.315	3.74 %

Source: Bloomberg

Norfolk Southern Corp.

66	Type:	Notes
	Description:	Senior
	CUSIP:	655844BT4
	Coupon Rate:	3.150%
	Maturity Date:	6/1/2027
	Amount Outstanding (\$ 000)	\$300,000
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	97.971	3.41 %
February	96.285	3.63
March	95.449	3.74
April	94.326	3.90
May	95.251	3.78
June	94.116	3.94
July	95.238	3.79
August	95.781	3.72
September	94.792	3.86
October	93.638	4.03
November	94.186	3.96
December	95.538	3.77
Average	95.214	3.79 %

Source: Bloomberg

Norfolk Southern Corp.

67	Type:	Notes (Exchange)
	Description:	Senior
	CUSIP:	655844BX5
	Coupon Rate:	3.942%
	Maturity Date:	11/1/2047
	Amount Outstanding (\$ 000)	\$749,997
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	92.286	4.41
July	94.440	4.28
August	94.222	4.29
September	93.232	4.35
October	89.022	4.63
November	89.094	4.63
December	91.383	4.48
Average	91.954	4.44 %

Source: Bloomberg

Norfolk Southern Corp.

68	Type:	Notes (Exchange)
	Description:	Senior
	CUSIP:	655844BV9
	Coupon Rate:	4.050%
	Maturity Date:	8/15/2052
	Amount Outstanding (\$ 000)	\$749,994
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	93.729	4.41
June	91.652	4.53
July	94.028	4.39
August	94.047	4.39
September	93.676	4.41
October	88.504	4.74
November	88.980	4.71
December	90.830	4.59
Average	91.931	4.52 %

Source: Bloomberg

Norfolk Southern Corp.

69	Type:	Notes (New)
	Description:	Senior
	CUSIP:	655844BY3
	Coupon Rate:	4.150%
	Maturity Date:	2/28/2048
	Amount Outstanding (\$ 000)	\$500,000
	Months Outstanding	10.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	98.864	4.22
March	99.297	4.19
April	97.083	4.33
May	97.272	4.31
June	96.119	4.39
July	98.569	4.24
August	97.449	4.30
September	96.711	4.35
October	91.830	4.66
November	91.965	4.66
December	94.543	4.49
Average	96.337	4.38 %

Source: Bloomberg

Prospectus supplement dated February 13, 2018.

Interest accrues from February 28, 2018.

Norfolk Southern Corp.

70	Type:	Notes (New)
	Description:	Senior
	CUSIP:	655844BY3
	Coupon Rate:	4.150%
	Maturity Date:	2/28/2048
	Amount Outstanding (\$ 000)	\$200,000
	Months Outstanding	5.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	A portion of this set of notes (ID = 69) was offered earlier and traded beginning February. This portion (ID = 70) was offered later, and traded beginning August. Both have the same CUSIP.	
March		
April		
May		
June		
July		
August	97.449	4.30
September	96.711	4.35
October	91.830	4.66
November	91.965	4.66
December	94.543	4.49
Average	94.500	4.49 %

Source: Bloomberg

Prospectus supplement dated July 30, 2018.

Interest accrues from February 28, 2018.

A portion of these bonds were offered earlier.

Norfolk Southern Corp.		
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71	Type:	Notes (New)
	Description:	Senior
	CUSIP:	655844CA4
	Coupon Rate:	3.650%
	Maturity Date:	8/1/2025
	Amount Outstanding (\$ 000)	\$300,000
	Months Outstanding	5.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	Not Traded	-
August	100.458	3.57
September	99.462	3.74
October	98.752	3.86
November	99.174	3.79
December	100.449	3.57
Average	99.659	3.71 %

Source: Bloomberg

Prospectus supplement dated July 30, 2018.

Interest accrues from August 2, 2018.

Norfolk Southern Corp.

72	Type:	Notes (New)
	Description:	Senior
	CUSIP:	655844BZ0
	Coupon Rate:	3.800%
	Maturity Date:	8/1/2028
	Amount Outstanding (\$ 000)	\$400,000
	Months Outstanding	5.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	Not Traded	-
August	100.152	3.78
September	99.114	3.91
October	97.515	4.11
November	97.977	4.06
December	99.641	3.85
Average	98.880	3.94 %

Source: Bloomberg

Prospectus supplement dated July 30, 2018.

Interest accrues from August 2, 2018.

Norfolk Southern Corp.

73	Type:	Notes (New)
	Description:	Senior
	CUSIP:	655844CB2
	Coupon Rate:	5.100%
	Maturity Date:	8/1/2118
	Amount Outstanding (\$ 000)	\$600,000
	Months Outstanding	5.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	100.547	5.07
August	99.563	5.12
September	98.968	5.15
October	94.682	5.39
November	95.092	5.36
December	96.903	5.26
Average	97.626	5.23 %

Source: Bloomberg

Prospectus supplement dated July 30, 2018.

Interest accrues from August 2, 2018.

Norfolk Southern Corp.

74	Type:	Conrail Notes
	Description:	CR NSC 2027
	CUSIP:	655844AJ7
	Coupon Rate:	7.800%
	Maturity Date:	5/15/2027
	Amount Outstanding (\$ 000)	\$319,135
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	133.900	3.49 %
February	131.912	3.68
March	131.691	3.68
April	129.765	3.87
May	131.541	3.64
June	128.818	3.92
July	127.067	4.10
August	127.891	3.97
September	126.117	4.16
October	125.407	4.22
November	125.834	4.14
December	125.845	4.12
Average	128.816	3.92 %

Source: Bloomberg

Norfolk Southern Corp.

75	Type:	Conrail Notes
	Description:	CR NSC 2037
	CUSIP:	655844AF5
	Coupon Rate:	7.050%
	Maturity Date:	5/1/2037
	Amount Outstanding (\$ 000)	\$178,995
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	135.195	4.33 %
February	131.930	4.54
March	132.394	4.50
April	129.553	4.68
May	131.690	4.54
June	130.976	4.58
July	130.227	4.62
August	131.480	4.53
September	128.766	4.71
October	126.999	4.83
November	128.406	4.72
December	131.541	4.50
Average	130.763	4.59 %

Source: Bloomberg

Norfolk Southern Corp.

76	Type:	Conrail Notes
	Description:	CR NSC 2097
	CUSIP:	655844AK4
	Coupon Rate:	7.900%
	Maturity Date:	5/15/2097
	Amount Outstanding (\$ 000)	\$225,222
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	144.516	5.44
May	145.641	5.40
June	144.988	5.42
July	144.192	5.45
August	146.536	5.36
September	142.058	5.54
October	138.633	5.68
November	140.267	5.61
December	145.517	5.40
Average	143.594	5.48 %

Source: Bloomberg

Union Pacific Corp.		
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77	Type:	Debentures
	Description:	UP Corp.
	CUSIP:	907818CS5
	Coupon Rate:	5.375%
	Maturity Date:	6/1/2033
	Amount Outstanding (\$ 000)	\$182,564
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	117.094	3.88 %
February	114.173	4.11
March	114.244	4.10
April	111.762	4.31
May	113.967	4.12
June	112.320	4.25
July	112.198	4.26
August	113.396	4.15
September	112.138	4.25
October	110.452	4.40
November	110.745	4.37
December	111.326	4.31
Average	112.818	4.21 %

Source: Bloomberg

Union Pacific Corp.		
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78	Type:	Debentures
	Description:	UP Corp.
	CUSIP:	907818CX4
	Coupon Rate:	6.150%
	Maturity Date:	5/1/2037
	Amount Outstanding (\$ 000)	\$108,773
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	125.695	4.19 %
February	122.360	4.41
March	122.583	4.39
April	119.682	4.59
May	122.713	4.37
June	121.062	4.48
July	122.453	4.38
August	123.918	4.28
September	122.497	4.37
October	120.228	4.52
November	120.039	4.53
December	121.328	4.44
Average	122.047	4.41 %

Source: Bloomberg

Union Pacific Corp.		
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79	Type:	Debentures
	Description:	UP Corp.
	CUSIP:	907818CU0
	Coupon Rate:	6.250%
	Maturity Date:	5/1/2034
	Amount Outstanding (\$ 000)	\$175,867
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	129.452	3.80 %
February	126.131	4.03
March	126.260	4.02
April	123.454	4.22
May	122.576	4.28
June	120.917	4.40
July	120.761	4.41
August	122.068	4.30
September	120.772	4.39
October	117.253	4.67
November	119.496	4.48
December	117.852	4.61
Average	122.249	4.30 %

Source: Bloomberg

Union Pacific Corp.		
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80	Type:	Debentures
	Description:	UP Corp.
	CUSIP:	907818CF3
	Coupon Rate:	6.625%
	Maturity Date:	2/1/2029
	Amount Outstanding (\$ 000)	\$393,759
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	127.946	3.54 %
February	125.351	3.77
March	125.298	3.76
April	122.294	4.05
May	122.106	4.05
June	120.378	4.22
July	121.933	4.04
August	122.902	3.92
September	121.850	4.02
October	120.608	4.14
November	120.793	4.10
December	121.291	4.03
Average	122.729	3.97 %

Source: Bloomberg

Union Pacific Corp.		
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81	Type:	Debentures
	Description:	UP Corp.
	CUSIP:	907818BY3
	Coupon Rate:	7.125%
	Maturity Date:	2/1/2028
	Amount Outstanding (\$ 000)	\$173,613
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	128.058	3.74 %
February	125.812	3.95
March	125.660	3.95
April	123.534	4.16
May	123.630	4.13
June	123.123	4.17
July	122.742	4.20
August	123.114	4.13
September	121.970	4.25
October	120.923	4.35
November	121.059	4.32
December	122.204	4.16
Average	123.486	4.13 %

Source: Bloomberg

Union Pacific Corp.		
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82	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EA2
	Coupon Rate:	1.800%
	Maturity Date:	2/1/2020
	Amount Outstanding (\$ 000)	\$249,456
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.939	2.35 %
February	98.541	2.59
March	98.477	2.66
April	98.190	2.87
May	98.378	2.81
June	98.210	2.97
July	98.219	3.03
August	98.448	2.94
September	98.403	3.03
October	98.293	3.21
November	98.458	3.17
December	98.770	2.97
Average	98.444	2.88 %

Source: Bloomberg

Union Pacific Corp.		
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83	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EE4
	Coupon Rate:	2.250%
	Maturity Date:	6/19/2020
	Amount Outstanding (\$ 000)	\$399,030
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	99.712	2.38 %
February	99.227	2.60
March	99.104	2.67
April	98.792	2.84
May	98.926	2.80
June	98.632	2.97
July	98.506	3.07
August	98.661	3.02
September	98.569	3.11
October	98.533	3.18
November	98.595	3.19
December	98.807	3.09
Average	98.839	2.91 %

Source: Bloomberg

Union Pacific Corp.		
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84	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DN5
	Coupon Rate:	2.750%
	Maturity Date:	4/15/2023
	Amount Outstanding (\$ 000)	\$322,958
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	99.545	2.84 %
February	98.590	3.05
March	98.287	3.12
April	97.671	3.26
May	97.606	3.29
June	96.848	3.47
July	96.619	3.54
August	97.217	3.41
September	96.705	3.54
October	96.515	3.60
November	97.075	3.48
December	97.825	3.30
Average	97.542	3.33 %

Source: Bloomberg

Union Pacific Corp.		
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85	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EH7
	Coupon Rate:	2.750%
	Maturity Date:	3/1/2026
	Amount Outstanding (\$ 000)	\$647,332
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	97.071	3.16 %
February	95.419	3.41
March	95.545	3.40
April	93.966	3.64
May	94.208	3.61
June	93.066	3.80
July	93.632	3.72
August	94.012	3.67
September	93.222	3.81
October	92.295	3.97
November	92.309	3.98
December	93.338	3.82
Average	94.007	3.67 %

Source: Bloomberg

Union Pacific Corp.		
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86	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DM7
	Coupon Rate:	2.950%
	Maturity Date:	1/15/2023
	Amount Outstanding (\$ 000)	\$298,982
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	100.763	2.78 %
February	99.741	3.01
March	99.583	3.04
April	98.422	3.31
May	98.687	3.26
June	97.997	3.43
July	97.758	3.50
August	98.453	3.33
September	97.684	3.54
October	97.463	3.61
November	97.451	3.62
December	98.019	3.48
Average	98.502	3.33 %

Source: Bloomberg

Union Pacific Corp.		
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87	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EP9
	Coupon Rate:	3.000%
	Maturity Date:	4/15/2027
	Amount Outstanding (\$ 000)	\$490,805
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.569	3.18 %
February	96.607	3.44
March	96.855	3.41
April	94.922	3.67
May	95.391	3.61
June	94.473	3.74
July	94.975	3.68
August	95.185	3.66
September	94.475	3.76
October	92.969	3.99
November	93.421	3.93
December	94.688	3.75
Average	95.211	3.65 %

Source: Bloomberg

Union Pacific Corp.		
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88	Type:	Notes
	Description:	UP Corp. (New)
	CUSIP:	907818ET1
	Coupon Rate:	3.200%
	Maturity Date:	6/8/2021
	Amount Outstanding (\$ 000)	\$597,370
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	100.159	3.14
July	99.899	3.24
August	100.293	3.09
September	99.849	3.26
October	99.710	3.32
November	99.740	3.31
December	100.511	2.98
Average	100.023	3.19 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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89	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DY1
	Coupon Rate:	3.250%
	Maturity Date:	1/15/2025
	Amount Outstanding (\$ 000)	\$347,674
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.225	3.05 %
February	99.767	3.29
March	99.514	3.33
April	98.121	3.57
May	98.192	3.56
June	97.486	3.69
July	97.767	3.64
August	97.833	3.63
September	97.341	3.73
October	96.325	3.92
November	96.604	3.88
December	97.611	3.70
Average	98.149	3.58 %

Source: Bloomberg

Union Pacific Corp.		
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90	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818ED6
	Coupon Rate:	3.250%
	Maturity Date:	8/15/2025
	Amount Outstanding (\$ 000)	\$498,924
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.126	3.08 %
February	99.390	3.34
March	99.166	3.38
April	97.810	3.59
May	97.962	3.57
June	97.044	3.73
July	97.443	3.67
August	97.544	3.65
September	96.997	3.75
October	95.835	3.96
November	96.002	3.93
December	97.405	3.70
Average	97.810	3.61 %

Source: Bloomberg

Union Pacific Corp.		
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91	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EK0
	Coupon Rate:	3.350%
	Maturity Date:	8/15/2046
	Amount Outstanding (\$ 000)	\$296,022
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	94.620	3.66 %
February	90.061	3.93
March	90.333	3.92
April	87.306	4.11
May	86.876	4.14
June	84.125	4.33
July	85.619	4.23
August	85.539	4.24
September	84.215	4.33
October	80.098	4.63
November	80.464	4.61
December	82.827	4.43
Average	86.007	4.21 %

Source: Bloomberg

Union Pacific Corp.		
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92	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EB0
	Coupon Rate:	3.375%
	Maturity Date:	2/1/2035
	Amount Outstanding (\$ 000)	\$445,027
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	98.462	3.50 %
February	95.234	3.76
March	95.202	3.76
April	92.097	4.03
May	92.715	3.98
June	89.809	4.24
July	91.331	4.10
August	91.417	4.10
September	90.239	4.21
October	87.428	4.47
November	87.478	4.47
December	88.733	4.36
Average	91.679	4.08 %

Source: Bloomberg

Union Pacific Corp.		
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93	Type:	Notes
	Description:	UP Corp. (New)
	CUSIP:	907818EU8
	Coupon Rate:	3.500%
	Maturity Date:	6/8/2023
	Amount Outstanding (\$ 000)	\$645,268
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	100.070	3.48
July	99.978	3.50
August	100.449	3.40
September	99.767	3.55
October	99.592	3.60
November	99.928	3.52
December	100.497	3.38
Average	100.040	3.49 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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94	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EQ7
	Coupon Rate:	3.600%
	Maturity Date:	9/15/2037
	Amount Outstanding (\$ 000)	\$494,758
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	100.941	3.53 %
February	96.776	3.84
March	96.491	3.86
April	93.755	4.07
May	93.884	4.06
June	91.494	4.25
July	93.208	4.12
August	92.488	4.18
September	91.879	4.23
October	88.074	4.55
November	88.102	4.55
December	89.627	4.42
Average	93.060	4.14 %

Source: Bloomberg

Union Pacific Corp.		
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95	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DR6
	Coupon Rate:	3.646%
	Maturity Date:	2/15/2024
	Amount Outstanding (\$ 000)	\$385,048
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	103.872	2.94 %
February	102.491	3.18
March	102.086	3.25
April	100.800	3.49
May	101.248	3.40
June	100.375	3.57
July	100.370	3.57
August	100.579	3.53
September	99.912	3.66
October	99.401	3.77
November	99.766	3.70
December	100.794	3.48
Average	100.975	3.46 %

Source: Bloomberg

Union Pacific Corp.		
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96	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DV7
	Coupon Rate:	3.750%
	Maturity Date:	3/15/2024
	Amount Outstanding (\$ 000)	\$396,589
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	104.074	3.02 %
February	102.858	3.23
March	102.549	3.28
April	101.338	3.50
May	101.640	3.43
June	100.930	3.57
July	100.861	3.58
August	101.061	3.54
September	100.457	3.66
October	99.854	3.78
November	100.160	3.72
December	101.319	3.47
Average	101.425	3.48 %

Source: Bloomberg

Union Pacific Corp.		
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97	Type:	Notes
	Description:	UP Corp. (New)
	CUSIP:	907818ES3
	Coupon Rate:	3.750%
	Maturity Date:	7/15/2025
	Amount Outstanding (\$ 000)	\$496,514
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	100.209	3.72
July	100.403	3.68
August	100.847	3.61
September	100.083	3.74
October	99.271	3.87
November	99.521	3.83
December	101.025	3.57
Average	100.194	3.72 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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98	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EM6
	Coupon Rate:	3.799%
	Maturity Date:	10/1/2051
	Amount Outstanding (\$ 000)	\$696,384
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	101.591	3.72 %
February	96.196	4.01
March	95.544	4.04
April	91.238	4.30
May	89.986	4.37
June	88.543	4.46
July	90.903	4.32
August	89.571	4.40
September	89.032	4.44
October	83.952	4.77
November	83.598	4.80
December	85.316	4.68
Average	90.456	4.36 %

Source: Bloomberg

Union Pacific Corp.		
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99	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EC8
	Coupon Rate:	3.875%
	Maturity Date:	2/1/2055
	Amount Outstanding (\$ 000)	\$443,913
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	99.333	3.91 %
February	94.364	4.18
March	95.090	4.14
April	92.476	4.28
May	90.815	4.38
June	87.696	4.57
July	90.265	4.41
August	89.400	4.47
September	88.352	4.53
October	83.110	4.87
November	83.930	4.82
December	86.592	4.64
Average	90.119	4.43 %

Source: Bloomberg

Union Pacific Corp.		
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100	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EY0
	Coupon Rate:	3.950%
	Maturity Date:	9/10/2028
	Amount Outstanding (\$ 000)	\$1,485,514
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	100.354	3.91
July	101.372	3.78
August	100.933	3.84
September	100.352	3.91
October	98.497	4.14
November	98.808	4.10
December	100.206	3.92
Average	100.075	3.94 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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101

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DG0
Coupon Rate:	4.000%
Maturity Date:	2/1/2021
Amount Outstanding (\$ 000)	\$498,543
Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	103.903	2.64 %
February	103.304	2.81
March	103.063	2.86
April	102.319	3.11
May	102.408	3.05
June	101.936	3.21
July	101.835	3.23
August	101.976	3.14
September	101.699	3.24
October	101.287	3.40
November	101.132	3.45
December	101.955	3.02
Average	102.235	3.10 %

Source: Bloomberg

Union Pacific Corp.		
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102

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EN4
Coupon Rate:	4.000%
Maturity Date:	4/15/2047
Amount Outstanding (\$ 000)	\$488,647
Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	106.945	3.61 %
February	100.731	3.96
March	100.462	3.97
April	97.321	4.16
May	96.508	4.21
June	94.325	4.35
July	96.951	4.18
August	96.453	4.21
September	95.131	4.30
October	90.535	4.60
November	89.903	4.64
December	92.776	4.45
Average	96.503	4.22 %

Source: Bloomberg

Union Pacific Corp.		
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103

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EF1
Coupon Rate:	4.050%
Maturity Date:	11/15/2045
Amount Outstanding (\$ 000)	\$489,769
Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	106.183	3.69 %
February	101.464	3.96
March	101.497	3.96
April	97.653	4.19
May	97.376	4.21
June	94.749	4.38
July	96.426	4.27
August	96.378	4.28
September	94.803	4.38
October	90.639	4.66
November	90.101	4.70
December	91.907	4.58
Average	96.598	4.27 %

Source: Bloomberg

Union Pacific Corp.		
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104	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EJ3
	Coupon Rate:	4.050%
	Maturity Date:	3/1/2046
	Amount Outstanding (\$ 000)	\$586,841
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	106.544	3.67 %
February	101.893	3.94
March	101.493	3.96
April	97.720	4.19
May	97.480	4.20
June	94.626	4.39
July	96.505	4.27
August	96.012	4.30
September	94.497	4.40
October	90.362	4.68
November	90.006	4.70
December	92.626	4.52
Average	96.647	4.27 %

Source: Bloomberg

Union Pacific Corp.		
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105	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818ER5
	Coupon Rate:	4.100%
	Maturity Date:	9/15/2067
	Amount Outstanding (\$ 000)	\$494,315
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	91.307	4.54
May	90.896	4.57
June	87.747	4.75
July	89.748	4.63
August	88.149	4.72
September	87.290	4.77
October	82.784	5.05
November	83.109	5.03
December	85.462	4.89
Average	87.388	4.77 %

Source: Bloomberg

Union Pacific Corp.		
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106	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DZ8
	Coupon Rate:	4.150%
	Maturity Date:	1/15/2045
	Amount Outstanding (\$ 000)	\$341,962
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	106.614	3.76 %
February	102.711	3.98
March	102.716	3.98
April	99.442	4.19
May	99.209	4.20
June	96.408	4.38
July	98.092	4.27
August	97.737	4.29
September	96.254	4.39
October	91.787	4.70
November	91.298	4.73
December	93.812	4.56
Average	98.007	4.29 %

Source: Bloomberg

Union Pacific Corp.		
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107	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DK1
	Coupon Rate:	4.163%
	Maturity Date:	7/15/2022
	Amount Outstanding (\$ 000)	\$682,420
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	105.817	2.77 %
February	104.545	3.04
March	104.211	3.11
April	103.319	3.31
May	103.588	3.22
June	103.188	3.31
July	103.123	3.31
August	103.322	3.24
September	102.587	3.43
October	102.209	3.52
November	101.992	3.57
December	102.760	3.33
Average	103.388	3.26 %

Source: Bloomberg

Union Pacific Corp.		
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108

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DP0
Coupon Rate:	4.250%
Maturity Date:	4/15/2043
Amount Outstanding (\$ 000)	\$318,109
Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	107.822	3.77 %
February	104.174	3.99
March	103.584	4.02
April	100.675	4.21
May	100.930	4.19
June	98.194	4.37
July	99.235	4.30
August	98.972	4.32
September	97.624	4.41
October	93.652	4.69
November	93.573	4.70
December	95.667	4.55
Average	99.509	4.29 %

Source: Bloomberg

Union Pacific Corp.		
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109

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DL9
Coupon Rate:	4.300%
Maturity Date:	6/15/2042
Amount Outstanding (\$ 000)	\$297,129
Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	108.108	3.79 %
February	103.981	4.04
March	104.241	4.02
April	101.400	4.21
May	101.439	4.20
June	98.855	4.38
July	99.500	4.33
August	99.796	4.31
September	98.559	4.40
October	94.765	4.67
November	95.925	4.59
December	97.754	4.46
Average	100.360	4.28 %

Source: Bloomberg

Union Pacific Corp.		
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110	Type:	Notes
	Description:	UP Corp. (New)
	CUSIP:	907818EV6
	Coupon Rate:	4.375%
	Maturity Date:	9/10/2038
	Amount Outstanding (\$ 000)	\$741,555
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	100.964	4.30
July	103.429	4.12
August	102.502	4.19
September	101.995	4.22
October	97.606	4.56
November	96.810	4.62
December	99.178	4.44
Average	100.355	4.35 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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111	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818EG9
	Coupon Rate:	4.375%
	Maturity Date:	11/15/2065
	Amount Outstanding (\$ 000)	\$569,095
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	96.914	4.53
May	94.668	4.66
June	92.965	4.75
July	94.102	4.69
August	93.791	4.70
September	92.382	4.78
October	88.067	5.04
November	88.348	5.02
December	89.936	4.93
Average	92.353	4.79 %

Source: Bloomberg

Union Pacific Corp.		
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112	Type:	Notes
	Description:	UP Corp. (New)
	CUSIP:	907818EW4
	Coupon Rate:	4.500%
	Maturity Date:	9/10/2048
	Amount Outstanding (\$ 000)	\$1,483,829
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	101.473	4.41
July	104.515	4.23
August	102.917	4.32
September	101.904	4.38
October	97.150	4.68
November	96.485	4.72
December	99.516	4.53
Average	100.566	4.47 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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113	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DJ4
	Coupon Rate:	4.750%
	Maturity Date:	9/15/2041
	Amount Outstanding (\$ 000)	\$316,326
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	114.698	3.80 %
February	110.512	4.05
March	110.265	4.07
April	107.204	4.26
May	106.619	4.30
June	105.090	4.40
July	106.296	4.32
August	105.741	4.35
September	104.598	4.43
October	100.308	4.73
November	101.146	4.67
December	102.555	4.57
Average	106.253	4.33 %

Source: Bloomberg

Union Pacific Corp.		
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114	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DU9
	Coupon Rate:	4.750%
	Maturity Date:	12/15/2043
	Amount Outstanding (\$ 000)	\$292,983
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	113.430	3.92 %
February	109.263	4.16
March	109.973	4.12
April	106.649	4.32
May	105.734	4.38
June	103.460	4.52
July	105.528	4.39
August	106.726	4.31
September	105.344	4.40
October	102.634	4.57
November	101.272	4.66
December	101.691	4.64
Average	105.975	4.37 %

Source: Bloomberg

Union Pacific Corp.		
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115	Type:	Notes
	Description:	UP Corp. (New)
	CUSIP:	907818EX2
	Coupon Rate:	4.800%
	Maturity Date:	9/10/2058
	Amount Outstanding (\$ 000)	\$494,501
	Months Outstanding	7.0

End of Month in 2018	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	103.560	4.60
July	105.684	4.49
August	104.686	4.54
September	103.341	4.62
October	98.055	4.91
November	98.704	4.87
December	100.823	4.75
Average	102.122	4.68 %

Source: Bloomberg

Prospectus supplement dated June 5, 2018.

Original prospectus dated February 12, 2018.

Interest accrues from June 8, 2018.

Union Pacific Corp.		
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116	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DT2
	Coupon Rate:	4.821%
	Maturity Date:	2/1/2044
	Amount Outstanding (\$ 000)	\$222,403
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	115.987	3.84 %
February	111.842	4.08
March	112.019	4.07
April	108.976	4.24
May	108.841	4.25
June	105.377	4.47
July	107.697	4.32
August	107.027	4.36
September	105.273	4.47
October	101.545	4.72
November	101.116	4.74
December	102.917	4.62
Average	107.385	4.35 %

Source: Bloomberg

Union Pacific Corp.		
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117	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DX3
	Coupon Rate:	4.850%
	Maturity Date:	6/15/2044
	Amount Outstanding (\$ 000)	\$143,885
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	113.189	4.03 %
February	109.094	4.27
March	109.457	4.25
April	106.344	4.44
May	106.779	4.41
June	105.034	4.52
July	104.908	4.53
August	106.431	4.43
September	105.053	4.52
October	102.144	4.71
November	101.263	4.76
December	103.091	4.64
Average	106.066	4.46 %

Source: Bloomberg

Union Pacific Corp.		
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118	Type:	Notes
	Description:	UP Corp.
	CUSIP:	907818DF2
	Coupon Rate:	5.780%
	Maturity Date:	7/15/2040
	Amount Outstanding (\$ 000)	\$63,193
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	122.214	4.24 %
February	118.516	4.46
March	118.795	4.44
April	115.886	4.63
May	116.409	4.59
June	122.174	4.22
July	122.038	4.23
August	119.996	4.35
September	118.486	4.45
October	115.753	4.62
November	116.154	4.59
December	117.438	4.51
Average	118.655	4.44 %

Source: Bloomberg

Note: This is the exchange-traded portion of these notes. The Rule 144-A notes similar to these have a different CUSIP, and are shown on the next page.

118	\$63,193
119	<u>10</u>
	\$63,203

Union Pacific Corp.		
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119	Type:	Notes
	Description:	UP Corp. 144A
	CUSIP:	907818DE5
	Coupon Rate:	5.780%
	Maturity Date:	7/15/2040
	Amount Outstanding (\$ 000)	\$10
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	127.650	3.92 %
February	123.050	4.18
March	122.371	4.22
April	119.787	4.38
May	122.682	4.20
June	122.055	4.23
July	123.240	4.16
August	121.124	4.28
September	120.584	4.31
October	115.489	4.64
November	114.327	4.72
December	116.180	4.59
Average	120.712	4.32 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers and have their own CUSIP. The exchange-traded notes similar to these are on the proceeding page.

118	\$63,193
119	<u>10</u>
	\$63,203

Union Pacific Corp.		
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120

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DD7
Coupon Rate:	6.125%
Maturity Date:	2/15/2020
Amount Outstanding (\$ 000)	\$162,264
Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	107.024	2.56 %
February	106.332	2.77
March	105.983	2.81
April	105.325	3.04
May	105.102	3.02
June	104.860	3.02
July	104.469	3.12
August	104.231	3.11
September	103.928	3.17
October	103.439	3.37
November	103.113	3.44
December	103.171	3.21
Average	104.748	3.05 %

Source: Bloomberg

Union Pacific Corp.		
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121	Type:	Notes
	Description:	UP Corp. Series B
	CUSIP:	90782ECK8
	Coupon Rate:	9.300%
	Maturity Date:	1/17/2020
	Amount Outstanding (\$ 000)	\$310
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	110.252	3.82 %
February	109.423	4.03
March	108.881	4.10
April	108.265	4.23
May	107.898	4.20
June	107.336	4.32
July	106.928	4.35
August	106.611	4.27
September	106.061	4.41
October	105.560	4.51
November	105.053	4.61
December	104.773	4.54
Average	107.253	4.28 %

Source: Bloomberg

Note: These are Medium Term Notes, referred to as Series B.

Union Pacific Corp.		
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122	Type:	Notes
	Description:	UP Corp. Series C
	CUSIP:	90782EDE1
	Coupon Rate:	9.940%
	Maturity Date:	4/1/2020
	Amount Outstanding (\$ 000)	\$4,100
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	112.924	3.67 %
February	111.980	3.89
March	111.357	3.96
April	110.633	4.10
May	110.232	4.06
June	109.463	4.25
July	108.986	4.28
August	108.654	4.20
September	108.024	4.35
October	107.454	4.44
November	106.891	4.52
December	106.607	4.42
Average	109.434	4.18 %

Source: Bloomberg

Note: These are Medium Term Notes, referred to as Series C.

Union Pacific Corp.		
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123	Type:	Notes
	Description:	UP Corp. Series C
	CUSIP:	90782ECU6
	Coupon Rate:	10.000%
	Maturity Date:	4/10/2020
	Amount Outstanding (\$ 000)	\$2,500
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	112.995	3.76 %
February	112.051	3.98
March	111.429	4.05
April	110.699	4.19
May	110.303	4.15
June	109.532	4.34
July	109.058	4.38
August	108.732	4.29
September	108.102	4.44
October	107.534	4.53
November	106.976	4.61
December	106.702	4.50
Average	109.509	4.27 %

Source: Bloomberg

Note: These are Medium Term Notes, referred to as Series C.

Union Pacific Corp.		
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124	Type:	Notes
	Description:	UP Corp. Series C
	CUSIP:	90782EDG6
	Coupon Rate:	9.900%
	Maturity Date:	4/15/2020
	Amount Outstanding (\$ 000)	\$250
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	112.540	3.90 %
February	111.619	4.12
March	111.018	4.19
April	110.303	4.34
May	109.925	4.30
June	109.278	4.43
July	108.823	4.46
August	108.511	4.37
September	107.893	4.53
October	107.340	4.62
November	106.799	4.69
December	106.544	4.59
Average	109.216	4.38 %

Source: Bloomberg

Note: These are Medium Term Notes, referred to as Series C.

Note: UP bond numbers 124 and 125 are listed together on the source document from UP, totalling 775, but they are found under two separate CUSIPs in Bloomberg's data.

UP bond number 124	250
UP bond number 125	<u>525</u>
Total	775

Union Pacific Corp.		
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125	Type:	Notes
	Description:	UP Corp. Series C
	CUSIP:	90782EDJ0
	Coupon Rate:	9.900%
	Maturity Date:	4/15/2020
	Amount Outstanding (\$ 000)	\$525
	Months Outstanding	12.0

End of Month in 2018	Price	Yield
January	112.540	3.90 %
February	111.618	4.12
March	111.017	4.19
April	110.302	4.34
May	109.925	4.30
June	109.278	4.43
July	108.822	4.46
August	108.511	4.37
September	107.893	4.53
October	107.340	4.62
November	106.799	4.69
December	106.544	4.59
Average	109.216	4.38 %

Source: Bloomberg

Note: These are Medium Term Notes, referred to as Series C.

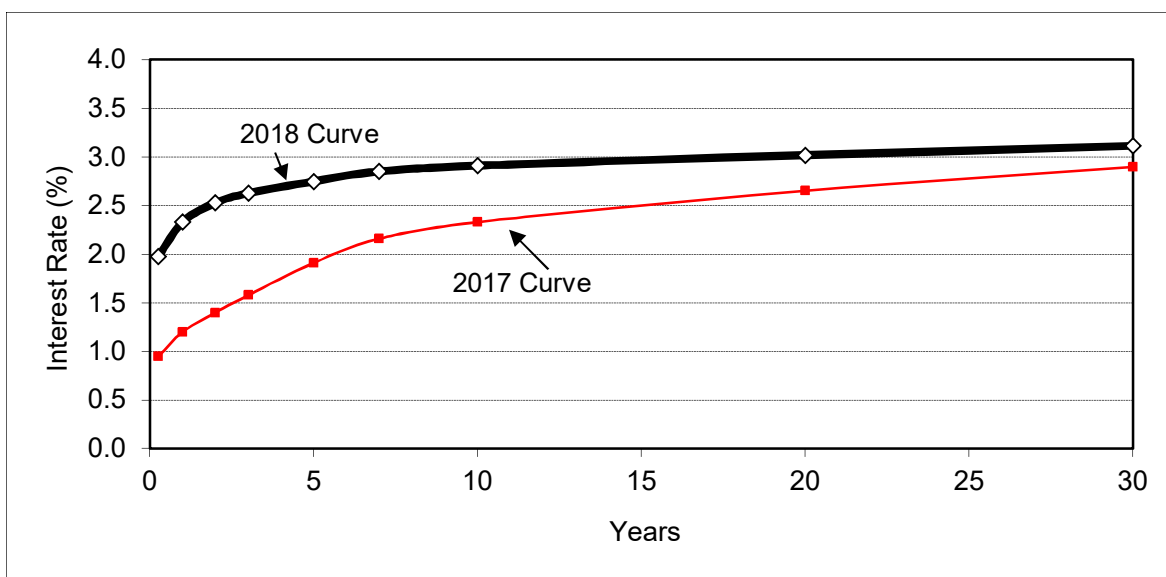
Note: UP bond numbers 124 and 125 are listed together on the source document from UP, totalling 775, but they are found under two separate CUSIPs in Bloomberg's data.

UP bond number 124	250
UP bond number 125	<u>525</u>
Total	775

Interest Rates on Selected Government Instruments

Yield in Percent Per Annum, Constant Maturity Rates for 2018

	3 Mo.	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
January	1.43	1.80	2.03	2.15	2.38	2.51	2.58	2.73	2.88
February	1.59	1.96	2.18	2.36	2.60	2.78	2.86	3.02	3.13
March	1.73	2.06	2.28	2.42	2.63	2.77	2.84	2.97	3.09
April	1.79	2.15	2.38	2.52	2.70	2.82	2.87	2.96	3.07
May	1.90	2.27	2.51	2.66	2.82	2.93	2.98	3.05	3.13
June	1.94	2.33	2.53	2.65	2.78	2.87	2.91	2.98	3.05
July	1.99	2.39	2.61	2.70	2.78	2.85	2.89	2.94	3.01
August	2.07	2.45	2.64	2.71	2.77	2.84	2.89	2.97	3.04
September	2.17	2.56	2.77	2.84	2.89	2.96	3.00	3.08	3.15
October	2.29	2.65	2.86	2.94	3.00	3.09	3.15	3.27	3.34
November	2.37	2.70	2.86	2.91	2.95	3.04	3.12	3.27	3.36
December	2.41	2.66	2.68	2.67	2.68	2.75	2.83	2.98	3.10
Average	1.97	2.33	2.53	2.63	2.75	2.85	2.91	3.02	3.11



Source: Federal Reserve statistical release H.15, Treasury Constant Maturities, Nominal

Equipment Trust Certificates for CSX

Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)			Current Valuation		Current	
		Beg.	Ending	Avg O/S	Interest Rate	Valuation Factor	Market Value	Interest
1. [None]				--			--	--
2.				--			--	--
3.				--			--	--
4.				--			--	--
5.				--			--	--
6.				--			--	--
7.				--			--	--
8.				--			--	--
9.				--			--	--
10.				--			--	--
11.				--			--	--
12.				--			--	--
13.				--			--	--
14.				--			--	--
15.				--			--	--
Total		\$0	\$0	\$0	--		\$0	\$0

Non-Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Equipment Trust Certificates for CSX (continued)

Entire ETC Current – Not Used for Cost or Market Value

ETC ID	Maturity	Balance 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Grand Totals (for reconciliation to carrier data)

	Balance For 2018 (\$000)	
	Beg.	Ending
Total Modeled	\$0	\$0
Total Non-Modeled	0	0
Sub Total	0	0
Total All Current	0	0
Grand Total	\$0	\$0
 From CSX:		
Total ETCs		\$0
Difference		\$0

Equipment Trust Certificates for KCS

Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)			Current Valuation		Current	
		Beg.	Ending	Avg O/S	Interest Rate	Valuation Factor	Market Value	Interest
1. [None]				--			--	--
2.				--			--	--
3.				--			--	--
4.				--			--	--
5.				--			--	--
6.				--			--	--
7.				--			--	--
8.				--			--	--
9.				--			--	--
10.				--			--	--
11.				--			--	--
12.				--			--	--
13.				--			--	--
14.				--			--	--
15.				--			--	--
Total		\$0	\$0	\$0	--		\$0	\$0

Non-Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Equipment Trust Certificates for KCS (continued)

Entire ETC Current – Not Used for Cost or Market Value

ETC ID	Maturity	Balance 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Grand Totals (for reconciliation to carrier data)

	Balance For 2018 (\$000)	
	Beg.	Ending
Total Modeled	\$0	\$0
Total Non-Modeled	0	0
Sub Total	0	0
Total All Current	0	0
Grand Total	\$0	\$0
From KCS:		
Total ETCs		\$0
Difference		\$0

Equipment Trust Certificates for NS

Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)			Current Valuation		Current	
		Beg.	Ending	Avg O/S	Interest Rate	Valuation Factor	Market Value	Interest
1. [None]				--			--	--
2.				--			--	--
3.				--			--	--
4.				--			--	--
5.				--			--	--
6.				--			--	--
7.				--			--	--
8.				--			--	--
9.				--			--	--
10.				--			--	--
11.				--			--	--
12.				--			--	--
13.				--			--	--
14.				--			--	--
15.				--			--	--
Total		\$0	\$0	\$0	--		\$0	\$0

Non-Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Equipment Trust Certificates for NS (continued)

Entire ETC Current – Not Used for Cost or Market Value

ETC ID	Maturity	Balance 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Grand Totals (for reconciliation to carrier data)

	Balance For 2018 (\$000)	
	Beg.	Ending
Total Modeled	\$0	\$0
Total Non-Modeled	0	0
Sub Total	0	0
Total All Current	0	0
Grand Total	\$0	\$0
 From NS:		
Total ETCs		\$0
Difference		\$0

Equipment Trust Certificates for UP

Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)			Current Valuation		Current	
		Beg.	Ending	Avg O/S	Interest Rate	Valuation Factor	Market Value	Interest
1. ETC UPC Series J	1/2/2031	45,779	37,900	41,840	3.644%	1.16150	48,597	1,771
2. ETC UPC Series A	5/14/2026	445,828	428,958	437,393	3.574%	0.98594	431,244	15,415
3. ETC UPC Series 2015 A	5/12/2027	368,808	355,389	362,099	3.596%	0.95798	346,884	12,473
4. ETC UPC Series 2016 A	11/9/2029	144,425	139,318	141,872	3.625%	0.93872	133,178	4,827
5.				--			--	--
6.				--			--	--
7.				--			--	--
8.				--			--	--
9.				--			--	--
10.				--			--	--
11.				--			--	--
12.				--			--	--
13.				--			--	--
14.				--			--	--
15.				--			--	--
Total		\$1,004,840	\$961,565	\$983,203	3.593%		\$959,903	\$34,486

Non-Modeled ETCs

ETC ID	Maturity	Balance For 2018 (\$000)	
		Beg.	Ending
1. [None]			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$0	\$0

Equipment Trust Certificates for UP (continued)

Entire ETC Current – Not Used for Cost or Market Value

ETC ID	Maturity	Balance 2018 (\$000)	
		Beg.	Ending
1. ETC UPC Series I	2/23/2019	\$6,049	\$1,106
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
Total		\$6,049	\$1,106

Grand Totals (for reconciliation to carrier data)

Balance For 2018 (\$000)	
	Ending
Total Modeled	\$961,565
Total Non-Modeled	0
Sub Total	961,565
Total All Current	1,106
Grand Total	\$962,671
From UP:	
Total ETCs	\$962,671
Difference	\$0

2018 Market Value of Debt (\$000)

Type of Debt	Market Value			Percent of	
	Traded or Modeled	Non-Traded or Non-Modeled	Total	Subtotal	Total
Bonds, Notes & Debentures	\$43,274,930	\$343,951	\$43,618,880	97.85%	97.69%
Equipment Trust Certificates	959,903		959,903	2.15%	2.15%
Conditional Sales Agreements	0		0	0.00%	0.00%
Sub Total	\$44,234,833	\$343,951	\$44,578,784	100.00%	99.84%
All Other — Capital Leases		\$765,765	\$765,765	1045.91%	1.71%
All Other — Misc. Debt		-692,550	-692,550	-945.91%	-1.55%
All Other — Non-Modeled ETC		0	0	0.00%	0.00%
All Other — Non-Modeled CSA		0	0	0.00%	0.00%
Sub Total			\$73,216	100.00%	0.16%
Total Market Value			\$44,651,999		100.00%

General Notes:

Bonds, Notes, and Debentures from Appendix A. Securities that did not trade were assigned a market value equal to their book value. The traded portion accounts for 99.21 percent of the total market value for this category.

Equipment Trust Certificates from Appendix C.

All Conditional Sales Agreements have been retired.

Capital Leases and Miscellaneous Debt listed in work papers.

The capital leases and miscellaneous debt portion of the All Other debt category was assigned a market value equal to its book value, and totals to \$73,216 thousand. The non-modeled ETCs and CSAs are typically also assigned a market value equal to their book value, but there were none for this year. The All Other category totals to \$73,216 thousand, or 0.2 percent of total debt.

If negative numbers appear in Miscellaneous Debt, they typically are related to debt premiums and discounts.

2018 Flotation Costs for Bonds

	CSX Notes 2/15/2018	CSX Notes 2/15/2018	CSX Notes 2/15/2018	CSX Notes 11/15/2018	CSX Notes 11/15/2018	KSU Sr Notes 4/30/2018	NSC Sr Notes 2/13/2018
From 424(b)							
Face Amount	\$800,000,000	\$850,000,000	\$350,000,000	\$350,000,000	\$650,000,000	\$500,000,000	\$500,000,000
Coupon Rate	3.800%	4.300%	4.650%	4.250%	4.750%	4.700%	4.150%
Maturity Date	3/1/2028	3/1/2048	3/1/2068	3/15/2029	11/15/2048	5/1/2048	2/28/2048
Frequency of Coupon Payment	2	2	2	2	2	2	2
Interest Accrual Date	2/20/2018	2/20/2018	2/20/2018	11/15/2018	11/15/2018	5/3/2018	2/28/2018
Price To Investors	99.933	99.664	99.613	99.641	99.068	99.888	99.541
Proceeds from Sale (before expenses)	\$799,464,000	\$847,144,000	\$348,645,500	\$348,743,500	\$643,942,000	\$499,440,000	\$497,705,000
Underwriter Fee as % of Gross Proceeds	0.650%	0.875%	0.875%	0.650%	0.875%	0.875%	0.875%
Underwriter's Fee	\$5,200,000	\$7,437,500	\$3,062,500	\$2,275,000	\$5,687,500	\$4,375,000	\$4,375,000
Railroad Expenses Excluding Fee	\$200,000.00	\$212,500.00	\$87,500.00	\$105,000.00	\$195,000.00	\$1,240,000.00	\$850,000.00
Page in 424(b) for Expenses	S-21	S-21	S-21	S-21	S-21	S-32	S-17
Calculated							
Yield Based on Price to Investors	3.808%	4.320%	4.670%	4.293%	4.809%	4.707%	4.177%
Issue Price Per \$100 Less Flotation	\$99.26	\$98.76	\$98.71	\$98.96	\$98.16	\$98.77	\$98.50
Yield on New Issue Including Flotation	3.890%	4.374%	4.717%	4.375%	4.867%	4.778%	4.239%
Flotation Costs (Diff. in Pct Pts)	0.082%	0.054%	0.047%	0.083%	0.058%	0.071%	0.062%
Avg. Flotation Cost (Pct. Points) (includes costs on page 2 and 3)	0.078%						
Previous Year's Average	0.069%						

Source: SEC 424(b)(5) or 424(b)(2) filings.

In cases where multiple series of notes were issued with one set of expenses (excluding underwriting fee), the expenses are allocated by the face amount of the notes involved.

2018 Flotation Costs for Bonds

	NSC Sr Notes 7/10/2018	NSC Sr Notes 7/10/2018	NSC Sr Notes* 7/10/2018	NSC Sr Notes 7/10/2018
From 424(b)				
Face Amount	\$300,000,000	\$400,000,000	\$200,000,000	\$600,000,000
Coupon Rate	3.650%	3.800%	4.150%	5.100%
Maturity Date	8/1/2025	8/1/2028	2/28/2048	8/1/2118
Frequency of Coupon Payment	2	2	2	2
Interest Accrual Date	8/2/2018	8/2/2018	2/28/2018	8/2/2018
Price To Investors	99.786	99.778	98.157	99.806
Proceeds from Sale (before expenses)	\$299,358,000	\$399,112,000	\$196,314,000	\$598,836,000
Underwriter Fee as % of Gross Proceeds	0.625%	0.650%	0.875%	1.000%
Underwriter's Fee	\$1,875,000	\$2,600,000	\$1,750,000	\$6,000,000
Railroad Expenses Excluding Fee	\$440,000.00	\$586,666.67	\$293,333.33	\$880,000.00
Page in 424(b) for Expenses	S-20	S-20	S-20	S-20
Calculated				
Yield Based on Price to Investors	3.685%	3.827%	4.259%	5.110%
Issue Price Per \$100 Less Flotation	\$99.01	\$98.98	\$97.14	\$98.66
Yield on New Issue Including Flotation	3.812%	3.924%	4.321%	5.170%
Flotation Costs (Diff. in Pct Pts)	0.127%	0.097%	0.062%	0.060%

* The 2048 Notes are a further issuance of the notes issued February 2018 (Appendix E Page 1 herein).

Source: SEC 424(b)(5) or 424(b)(2) filings.

2018 Flotation Costs for Bonds

	UNP Notes 6/5/2018	UNP Notes 6/5/2018	UNP Notes 6/5/2018	UNP Notes 6/5/2018	UNP Notes 6/5/2018	UNP Notes 6/5/2018	UNP Notes 6/5/2018
From 424(b)							
Face Amount	\$600,000,000	\$650,000,000	\$500,000,000	\$1,500,000,000	\$750,000,000	\$1,500,000,000	\$500,000,000
Coupon Rate	3.200%	3.500%	3.750%	3.950%	4.375%	4.500%	4.800%
Maturity Date	6/8/2021	6/8/2023	7/15/2025	9/10/2028	9/10/2038	9/10/2048	9/10/2058
Frequency of Coupon Payment	2	2	2	2	2	2	2
Interest Accrual Date	6/8/2018	6/8/2018	6/8/2018	6/8/2018	6/8/2018	6/8/2018	6/8/2018
Price To Investors	99.938	99.909	99.996	99.751	99.849	99.899	99.890
Proceeds from Sale (before expenses)	\$599,628,000	\$649,408,500	\$499,980,000	\$1,496,265,000	\$748,867,500	\$1,498,485,000	\$499,450,000
Underwriter Fee as % of Gross Proceeds	0.350%	0.600%	0.625%	0.650%	0.875%	0.875%	0.875%
Underwriter's Fee	\$2,100,000	\$3,900,000	\$3,125,000	\$9,750,000	\$6,562,500	\$13,125,000	\$4,375,000
Railroad Expenses Excluding Fee	\$10,000.00	\$10,833.33	\$8,333.33	\$25,000.00	\$12,500.00	\$25,000.00	\$8,333.33
Page in 424(b) for Expenses	S-15	S-15	S-15	S-15	S-15	S-15	S-15
Calculated							
Yield Based on Price to Investors	3.222%	3.520%	3.750%	3.979%	4.386%	4.506%	4.806%
Issue Price Per \$100 Less Flotation	\$99.59	\$99.31	\$99.37	\$99.10	\$98.97	\$99.02	\$99.01
Yield on New Issue Including Flotation	3.346%	3.653%	3.852%	4.058%	4.452%	4.559%	4.856%
Flotation Costs (Diff. in Pct Pts)	0.124%	0.133%	0.102%	0.078%	0.066%	0.054%	0.050%

Source: SEC 424(b)(5) or 424(b)(2) filings.

Example of Source for Bond Flotation Costs

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Filed Pursuant to Rule 424(b)(2)
Registration No. 333-209541

Prospectus Supplement
(To Prospectus dated February 16, 2016)

\$2,000,000,000



\$800,000,000 3.800% Notes due 2028

\$850,000,000 4.300% Notes due 2048

\$350,000,000 4.650% Notes due 2068

We are offering \$800,000,000 aggregate principal amount of 3.800% Notes due 2028 (the "2028 Notes"), \$850,000,000 aggregate principal amount of 4.300% Notes due 2048 (the "2048 Notes") and \$350,000,000 aggregate principal amount of 4.650% Notes due 2068 (the "2068 Notes" and, together with the 2028 Notes and the 2048 Notes, the "Notes"). The 2028 Notes will mature on March 1, 2028, the 2048 Notes will mature on March 1, 2048, and the 2068 Notes will mature on March 1, 2068. Interest is payable on the Notes on March 1 and September 1 of each year, commencing September 1, 2018. Interest on the Notes will accrue from February 20, 2018. We may redeem the Notes of any series, in whole or in part, at any time, at the redemption prices set forth under the caption "Description of Notes—Optional Redemption."

The Notes will be senior obligations of our company and will rank equally with all of our other unsecured senior indebtedness.

The Notes of each series will be represented by one or more permanent global Notes in definitive, fully registered form without interest coupons, registered in the name of a nominee for The Depository Trust Company. The Notes of each series will be issued in denominations of \$2,000 and integral multiples of \$1,000 in excess thereof.

Investing in these Notes involves risks. See risks described as risk factors in Item 1A of our Annual Report on Form 10-K for the fiscal year ended December 31, 2017, as they may be amended, updated and modified periodically in our reports filed with the Securities and Exchange Commission.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement or the accompanying prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

	Price to Public ⁽¹⁾	Underwriting Discount	Proceeds to Us
Per 2028 Note	99.933%	0.650%	99.283%
2028 Notes Total	\$799,464,000	\$5,200,000	\$794,264,000
Per 2048 Note	99.664%	0.875%	98.789%
2048 Notes Total	\$847,144,000	\$7,437,500	\$839,706,500
Per 2068 Note	99.613%	0.875%	98.738%
2068 Notes Total	\$348,645,500	\$3,062,500	\$345,583,000

(1) Plus accrued interest from February 20, 2018 if settlement occurs after that.

CSX will not make application to list the Notes on any securities exchange or to include them in any automated quotation system.

We expect that delivery of the Notes will be made to investors on or about February 20, 2018, through the book-entry system of The Depository Trust Company for the accounts of its participants, including Euroclear Bank S.A./N.V., as operator of the Euroclear system, and Clearstream Banking, *société anonyme*.

Joint Book-Running Managers

Citigroup

J.P. Morgan

Morgan Stanley

UBS Investment Bank

Example of Source for Bond Flotation Costs

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In connection with the offering, the representatives, on behalf of the underwriters, may purchase and sell Notes of any series in the open market. These transactions may include over-allotment, syndicate covering transactions and stabilizing transactions. Over-allotment involves syndicate sales of the applicable series of Notes in excess of the principal amount of such Notes to be purchased by the underwriters in the offering, which creates a syndicate short position. Syndicate covering transactions involve purchases of the applicable series of Notes in the open market after the distribution has been completed, in order to cover syndicate short positions. Stabilizing transactions consist of certain bids or purchases of the applicable series of Notes made for the purpose of preventing or retarding a decline in the market price of such Notes while the offering is in progress.

The representatives, on behalf of the underwriters, may also impose a penalty bid. Penalty bids permit the underwriters to reclaim a selling concession from a syndicate member when the representatives, in covering syndicate short positions or making stabilizing purchases, repurchase Notes originally sold by that syndicate member.

Any of these activities may have the effect of preventing or retarding a decline in the market price of each series of the Notes. They may also cause the price of such Notes to be higher than the price that otherwise would exist in the open market in the absence of these transactions. The underwriters may conduct these transactions in the over-the-counter market or otherwise. If the underwriters commence any of these transactions, they may discontinue them at any time.

We estimate that our total expenses (excluding underwriting discounts and commissions) for this offering will be approximately \$500,000.

Certain of the underwriters and their affiliates have in the past provided, are currently providing and may in the future from time to time provide investment banking and other financing, trading, banking, research, transfer agent and trustee services to us or our subsidiaries, for which they have in the past received, and may currently or in the future receive, customary fees and expenses. Certain of the underwriters or their affiliates engage in commercial lending activities with us and are lenders under our bank credit facilities.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, or to contribute to payments the underwriters may be required to make because of any of those liabilities.

PRIIPs Regulation / Prospectus Directive / Prohibition of Sales to EEA Retail Investors

The Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the European Economic Area ("EEA"). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, "MiFID II"); or (ii) a customer within the meaning of Directive 2002/92/EC (as amended, the "Insurance Mediation Directive"), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (iii) not a qualified investor as defined in Directive 2003/71/EC (as amended, the "Prospectus Directive"). Consequently no key information document required by Regulation (EU) No 1286/2014 (as amended, the "PRIIPs Regulation") for offering or selling the Notes or otherwise making them available to retail investors in the EEA has been prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

This prospectus supplement and the accompanying prospectus have been prepared on the basis that any offer of notes in any Member State of the EEA will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of notes. This prospectus supplement and the accompanying prospectus is not a prospectus for the purposes of the Prospectus Directive.

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2018 Current Cost of Debt

Type of Debt	Cost Reference	Appendix D Weight	Current Cost	Weighted Cost
Type of Instrument				
Bonds, Notes & Debentures	App. A & Table 3	97.85%	4.095%	4.007%
Equipment Trust Certificates	App. C & Table 5	2.15%	3.593%	0.077%
Conditional Sales Agreements	Railroad Data	0.00%	--	--
Total Without Floatation Costs		100.00%		4.084%
Floatation Costs				
Bonds, Notes & Debentures	App. F & Table 8	97.85%	0.078%	0.076%
Equipment Trust Certificates	Tables 7 and 8	2.15%	0.077%	0.002%
Conditional Sales Agreements	Table 8	0.00%	not calculated	--
Total Floatation Costs		100.00%		0.078%
Weighted Cost of Debt				4.162%
Weighted Cost of Debt (rounded)				4.16%

Historical Weighted Cost of Debt (for comparison purposes only)			
Item	Year	Reference	Weighted Cost
Previous Year	2017	EP 558 (Sub-No. 21) Served December 6, 2018	3.57%
Highest	1982	EP 436 Decided July 22, 1983	14.0%
Lowest	2012	EP 558 (Sub-No. 16) Served August 30, 2013	3.29%

Market Value for Common Equity

CSX Data from Yahoo Finance 1-10-2019

Beg. of Wk. Date	Open	High	Low	End of Wk Close	Volume	Shares Outstanding	Capitalization (\$000)
1/1/2018	55.63	57.96	55.02	57.72	25766200	893,723,083	51,585,697
1/8/2018	57.34	59.76	57.34	59.25	28766300	893,723,083	52,953,093
1/15/2018	59.87	60.04	56.60	57.49	35335300	893,723,083	51,380,142
1/22/2018	57.62	58.01	55.87	57.91	37999400	893,723,083	51,755,504
1/29/2018	57.56	58.01	55.20	55.25	30123000	887,236,080	49,019,793
2/5/2018	54.89	55.04	48.43	50.89	46206400	887,236,080	45,151,443
2/12/2018	51.56	56.42	51.33	56.10	41303400	887,236,080	49,773,942
2/19/2018	55.73	56.37	54.32	55.84	21928200	887,236,080	49,543,263
2/26/2018	56.23	56.99	53.13	55.04	48201100	887,236,080	48,833,475
3/5/2018	54.83	58.00	53.78	58.00	33766200	887,236,080	51,459,693
3/12/2018	57.99	58.40	56.26	56.92	27982000	887,236,080	50,501,476
3/19/2018	56.58	57.76	54.19	54.27	22355600	887,236,080	48,150,302
3/26/2018	55.21	56.56	53.71	55.71	23704500	887,236,080	49,427,921
4/2/2018	55.48	56.04	53.53	54.35	28267400	875,353,546	47,575,463
4/9/2018	54.63	56.62	54.36	55.59	27082700	875,353,546	48,660,904
4/16/2018	56.18	61.50	55.95	60.04	48841500	875,353,546	52,556,228
4/23/2018	60.18	61.11	58.57	60.28	28388800	875,353,546	52,766,311
4/30/2018	60.57	61.07	57.97	59.97	25109900	875,353,546	52,494,953
5/7/2018	60.26	63.88	60.12	63.09	23724000	875,353,546	55,226,055
5/14/2018	63.79	64.07	61.89	63.76	16964300	875,353,546	55,812,540
5/21/2018	64.05	64.82	62.62	64.68	17232300	875,353,546	56,617,867
5/28/2018	64.11	65.95	63.62	65.44	19624600	875,353,546	57,283,138
6/4/2018	65.61	67.14	63.74	67.07	21147900	875,353,546	58,709,962
6/11/2018	67.07	67.69	65.26	66.65	26309300	875,353,546	58,342,316
6/18/2018	66.04	66.54	63.86	64.78	26124600	875,353,546	56,705,402
6/25/2018	64.69	65.42	62.72	63.78	23748500	875,353,546	55,830,048
7/2/2018	63.54	65.32	63.27	65.00	11396900	858,810,557	55,822,686
7/9/2018	65.32	66.69	64.35	64.71	23730600	858,810,557	55,573,630
7/16/2018	64.88	69.90	63.23	69.46	53164200	858,810,557	59,652,980
7/23/2018	68.73	72.22	68.73	70.27	32531400	858,810,557	60,348,615
7/30/2018	70.31	71.43	70.09	71.26	28199700	858,810,557	61,198,842
8/6/2018	71.37	72.91	71.30	72.39	18063100	858,810,557	62,169,295
8/13/2018	72.44	74.10	72.29	73.69	22745900	858,810,557	63,285,752
8/20/2018	73.90	75.14	73.68	74.65	22831800	858,810,557	64,110,210
8/27/2018	75.01	76.24	73.81	74.16	19312400	858,810,557	63,689,394
9/3/2018	74.16	74.91	73.41	73.63	20519900	858,810,557	63,234,219
9/10/2018	74.08	74.78	72.89	73.48	23132800	858,810,557	63,105,402
9/17/2018	73.63	74.69	72.69	73.99	38707700	858,810,557	63,543,391
9/24/2018	73.58	74.89	72.99	74.05	18691300	858,810,557	63,594,924
10/1/2018	74.38	75.66	73.76	74.55	21886500	844,420,361	62,951,540
10/8/2018	74.46	75.34	68.60	70.20	39800800	844,420,361	59,278,307
10/15/2018	70.07	73.05	67.84	67.94	46123100	844,420,361	57,369,921
10/22/2018	67.76	68.94	63.65	65.92	35995800	844,420,361	55,664,189
10/29/2018	66.96	70.49	64.64	69.18	34858500	844,420,361	58,417,001
11/5/2018	69.74	72.77	69.07	70.66	24708500	844,420,361	59,666,746
11/12/2018	70.66	73.61	69.49	72.61	24066400	844,420,361	61,313,363
11/19/2018	72.42	72.80	68.93	69.78	20153600	844,420,361	58,923,652
11/26/2018	70.37	73.09	69.88	72.63	23505000	844,420,361	61,330,248
12/3/2018	73.81	73.90	67.98	68.03	32665900	844,420,361	57,445,916
12/10/2018	67.72	70.39	65.58	65.83	24764700	844,420,361	55,588,194
12/17/2018	65.47	65.72	60.46	60.70	41128300	844,420,361	51,256,317
12/24/2018	60.41	62.98	58.47	62.08	15691700	844,420,361	52,421,618

Note: Capitalization calculated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

KSU Data from Yahoo Finance 1-10-2019

Beg. of Wk. Date	Open	High	Low	End of Wk Close	Volume	Shares Outstanding	Capitalization (\$000)
1/1/2018	106.28	109.69	105.22	109.19	5159700	103,543,121	11,305,874
1/8/2018	109.00	111.81	105.36	110.40	9843400	103,543,121	11,431,161
1/15/2018	111.02	112.80	106.96	110.00	8689900	103,053,604	11,335,896
1/22/2018	110.34	113.54	108.84	113.50	7652100	103,053,604	11,696,584
1/29/2018	113.49	114.75	110.03	110.15	5158400	103,053,604	11,351,355
2/5/2018	109.73	110.44	99.47	103.77	7036800	103,053,604	10,693,872
2/12/2018	103.89	109.30	102.54	109.01	5774700	103,053,604	11,233,874
2/19/2018	108.65	110.83	106.52	108.82	3669500	103,053,604	11,214,293
2/26/2018	109.52	110.79	101.62	104.62	7600400	103,053,604	10,781,468
3/5/2018	103.70	111.91	102.73	111.65	6508600	103,053,604	11,505,935
3/12/2018	111.80	112.15	104.90	105.51	7071700	103,053,604	10,873,186
3/19/2018	105.48	112.10	104.91	108.07	6400200	103,053,604	11,137,003
3/26/2018	109.86	110.69	106.35	109.85	3356300	103,053,604	11,320,438
4/2/2018	109.07	112.96	106.58	108.48	7606600	103,053,604	11,179,255
4/9/2018	109.08	111.77	108.08	110.13	4387800	102,600,502	11,299,393
4/16/2018	110.52	113.00	109.00	112.00	7720800	102,600,502	11,491,256
4/23/2018	113.42	114.91	106.07	109.26	7395000	102,600,502	11,210,131
4/30/2018	109.68	110.20	104.43	107.55	4845200	102,600,502	11,034,684
5/7/2018	107.91	111.11	106.51	110.00	4036900	102,600,502	11,286,055
5/14/2018	110.06	110.46	107.39	109.00	5483200	102,600,502	11,183,455
5/21/2018	109.70	112.87	107.07	112.04	4192100	102,600,502	11,495,360
5/28/2018	111.54	111.72	106.65	108.43	4755700	102,600,502	11,124,972
6/4/2018	109.06	110.61	104.46	109.25	5572800	102,600,502	11,209,105
6/11/2018	109.11	111.00	108.10	110.10	4236700	102,600,502	11,296,315
6/18/2018	109.25	109.63	105.95	108.28	3987400	102,600,502	11,109,582
6/25/2018	108.49	108.49	103.30	105.96	4279400	102,600,502	10,871,549
7/2/2018	105.50	107.44	104.71	106.51	2407700	102,600,502	10,927,980
7/9/2018	107.11	108.94	105.20	106.61	3825700	102,159,153	10,891,187
7/16/2018	106.90	111.34	103.98	111.05	5995500	102,159,153	11,344,774
7/23/2018	113.57	117.13	110.03	116.85	6122700	102,159,153	11,937,297
7/30/2018	116.92	117.79	114.17	115.77	5356500	102,159,153	11,826,965
8/6/2018	115.79	116.31	114.26	115.02	2614900	102,159,153	11,750,345
8/13/2018	115.15	115.78	111.96	115.36	3811300	102,159,153	11,785,080
8/20/2018	115.50	118.55	113.44	113.71	4904900	102,159,153	11,616,517
8/27/2018	116.45	120.34	114.89	115.96	8112400	102,159,153	11,846,375
9/3/2018	116.36	119.28	114.13	118.07	5176200	102,159,153	12,061,931
9/10/2018	118.82	120.21	116.23	117.24	4738900	102,159,153	11,977,139
9/17/2018	117.50	119.48	116.22	117.11	4005600	102,159,153	11,963,859
9/24/2018	116.90	117.11	112.94	113.28	5137500	102,159,153	11,572,589
10/1/2018	115.52	117.20	111.97	112.10	5814600	102,159,153	11,452,041
10/8/2018	111.84	113.79	101.78	102.57	7536400	101,697,441	10,431,107
10/15/2018	103.56	107.31	101.93	106.12	8430600	101,697,441	10,792,133
10/22/2018	106.35	106.35	101.12	102.25	7630000	101,697,441	10,398,563
10/29/2018	103.81	104.22	97.46	103.35	6707400	101,697,441	10,510,430
11/5/2018	103.60	104.93	101.32	102.42	5245200	101,697,441	10,415,852
11/12/2018	102.33	102.57	96.33	100.84	5725800	101,697,441	10,255,170
11/19/2018	100.25	100.82	95.54	98.20	3898800	101,697,441	9,986,688
11/26/2018	98.54	103.67	98.37	103.05	6626700	101,697,441	10,479,922
12/3/2018	104.62	105.71	97.39	98.22	4734700	101,697,441	9,988,723
12/10/2018	97.71	100.45	95.19	96.67	5781600	101,697,441	9,831,091
12/17/2018	96.41	98.25	92.59	92.74	6080200	101,697,441	9,431,420
12/24/2018	92.46	96.54	90.55	95.59	3284100	101,697,441	9,721,258

Note: Capitalization calculated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

NSC Data from Yahoo Finance 1-10-2019

Beg. of Wk. Date	Open	High	Low	End of Wk Close	Volume	Shares Outstanding	Capitalization (\$000)
1/1/2018	145.96	151.85	144.83	150.27	5340900	286,148,766	42,999,576
1/8/2018	150.00	156.08	149.99	154.34	7434200	286,148,766	44,164,199
1/15/2018	154.88	157.15	151.34	151.40	9375100	286,148,766	43,322,921
1/22/2018	151.44	152.27	147.17	150.97	11762500	286,148,766	43,199,879
1/29/2018	150.97	152.40	144.61	145.03	7929700	283,997,242	41,188,120
2/5/2018	144.74	146.73	131.81	138.22	11468100	283,997,242	39,254,099
2/12/2018	139.25	144.07	137.36	142.64	7409300	283,997,242	40,509,366
2/19/2018	141.71	143.41	138.80	142.62	6662300	283,997,242	40,503,685
2/26/2018	143.25	147.61	136.11	138.66	8392000	283,997,242	39,379,059
3/5/2018	137.84	145.97	136.49	145.53	7268100	283,997,242	41,330,118
3/12/2018	145.38	145.99	135.90	138.59	9668400	283,997,242	39,359,177
3/19/2018	137.99	141.87	131.85	132.18	9587800	283,997,242	37,538,753
3/26/2018	133.95	137.77	131.81	135.78	7380300	283,997,242	38,561,145
4/2/2018	135.57	136.53	127.79	129.36	12086400	282,541,886	36,549,619
4/9/2018	130.16	134.49	128.74	133.51	8035300	282,541,886	37,722,166
4/16/2018	134.74	140.32	134.74	136.75	7974800	282,541,886	38,637,603
4/23/2018	136.70	147.84	133.47	146.62	14437900	282,541,886	41,426,290
4/30/2018	147.00	147.74	138.34	143.92	8990900	282,541,886	40,663,428
5/7/2018	144.37	153.73	144.04	152.40	7982800	282,541,886	43,059,382
5/14/2018	152.66	153.73	149.17	152.49	6733800	282,541,886	43,084,814
5/21/2018	153.26	154.65	148.99	153.02	8201100	282,541,886	43,234,561
5/28/2018	151.50	156.00	150.15	155.23	7086200	282,541,886	43,858,976
6/4/2018	155.72	156.17	148.60	154.23	7466600	282,541,886	43,576,434
6/11/2018	153.73	158.58	151.85	154.66	9097400	282,541,886	43,697,929
6/18/2018	153.29	154.84	149.11	151.82	6033000	282,541,886	42,895,511
6/25/2018	154.20	154.21	147.22	150.87	9291300	282,541,886	42,627,093
7/2/2018	150.37	155.28	149.89	154.52	3931300	280,029,764	43,270,200
7/9/2018	155.62	160.36	154.61	159.46	8957700	280,029,764	44,653,548
7/16/2018	160.31	162.67	153.22	161.85	10054600	280,029,764	45,322,819
7/23/2018	161.89	172.81	155.35	168.24	12357200	280,029,764	47,112,209
7/30/2018	168.32	171.71	166.76	171.62	7687800	280,029,764	48,058,707
8/6/2018	171.47	174.43	170.19	171.94	5953500	280,029,764	48,148,318
8/13/2018	172.86	175.00	170.65	174.07	7552700	280,029,764	48,744,783
8/20/2018	174.42	176.69	173.12	174.86	6478200	280,029,764	48,966,005
8/27/2018	176.01	177.08	173.05	173.84	8458000	280,029,764	48,680,373
9/3/2018	173.80	177.85	173.17	177.10	6562100	280,029,764	49,593,273
9/10/2018	177.88	180.32	177.19	179.40	8289100	280,029,764	50,237,338
9/17/2018	179.53	186.91	178.74	184.24	11936700	280,029,764	51,592,685
9/24/2018	184.04	185.11	180.15	180.50	9170900	280,029,764	50,545,372
10/1/2018	182.39	185.51	181.13	183.02	8482600	272,346,940	49,844,938
10/8/2018	182.99	184.75	167.01	170.19	11396000	272,346,940	46,350,726
10/15/2018	170.17	173.97	163.19	163.92	14702600	272,346,940	44,643,110
10/22/2018	163.29	167.41	155.00	161.94	17568000	272,346,940	44,103,864
10/29/2018	163.35	171.60	158.83	168.59	11097600	272,346,940	45,914,970
11/5/2018	169.50	173.66	165.92	170.32	8643400	272,346,940	46,386,133
11/12/2018	170.66	174.65	165.53	172.05	10106800	272,346,940	46,857,292
11/19/2018	171.11	172.02	161.57	163.90	8322200	272,346,940	44,637,662
11/26/2018	164.90	171.92	161.17	170.74	11241600	272,346,940	46,500,518
12/3/2018	173.27	175.46	156.93	156.99	10565300	272,346,940	47,755,747
12/10/2018	156.03	159.97	150.31	150.88	12396200	272,346,940	41,091,708
12/17/2018	150.10	153.76	143.59	144.38	15899700	272,346,940	39,321,453
12/24/2018	143.41	150.18	138.65	148.01	5869600	272,346,940	40,310,069

Note: Capitalization calculated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

UNP Data from Yahoo Finance 1-10-2019

Beg. of Wk. Date	Open	High	Low	End of Wk Close	Volume	Shares Outstanding	Capitalization (\$000)
1/1/2018	134.71	139.72	134.18	137.53	18717800	787,168,815	108,259,326
1/8/2018	137.48	141.81	137.46	141.17	27748800	787,168,815	111,124,620
1/15/2018	142.07	142.19	139.61	141.25	17435000	787,168,815	111,187,595
1/22/2018	141.35	143.05	131.82	134.23	34335900	787,168,815	105,661,667
1/29/2018	134.20	137.08	127.22	129.36	30616500	779,305,276	100,810,931
2/5/2018	128.59	131.82	121.22	127.28	43012800	779,305,276	99,189,975
2/12/2018	127.75	135.53	126.15	134.27	21072400	779,305,276	104,637,323
2/19/2018	133.14	135.40	129.93	134.97	13414100	779,305,276	105,182,834
2/26/2018	135.90	139.86	125.31	128.50	34440300	779,305,276	100,140,728
3/5/2018	127.75	137.38	125.36	137.28	21935800	779,305,276	106,983,028
3/12/2018	137.03	139.55	134.29	137.16	23111400	779,305,276	106,889,515
3/19/2018	136.80	140.25	131.61	131.94	19929200	779,305,276	102,821,540
3/26/2018	133.61	135.68	129.80	134.43	17087200	779,305,276	104,762,003
4/2/2018	135.28	136.39	128.66	130.28	23433200	779,305,276	101,527,891
4/9/2018	131.01	135.29	128.44	134.32	18487000	779,305,276	104,676,290
4/16/2018	135.67	141.10	135.03	135.66	19416600	770,245,910	104,491,563
4/23/2018	135.41	137.30	126.37	135.20	24641300	770,245,910	104,137,245
4/30/2018	135.53	136.52	129.45	134.13	18566700	770,245,910	103,313,088
5/7/2018	134.44	142.74	134.21	142.36	15781100	770,245,910	109,652,209
5/14/2018	142.81	144.45	139.37	143.80	13588300	770,245,910	110,761,364
5/21/2018	144.41	146.73	141.20	145.06	14309200	770,245,910	111,731,870
5/28/2018	143.68	148.03	142.44	146.92	16929900	770,245,910	113,164,528
6/4/2018	147.79	147.95	140.16	144.52	23433600	770,245,910	111,315,942
6/11/2018	144.33	148.33	143.92	147.02	19919400	770,245,910	113,241,557
6/18/2018	145.70	148.27	141.65	143.95	17614200	770,245,910	110,876,896
6/25/2018	143.18	143.83	138.87	141.68	16232900	770,245,910	109,128,435
7/2/2018	140.96	144.07	140.48	143.06	10105300	770,245,910	110,191,378
7/9/2018	143.99	145.63	139.13	139.94	18125400	739,494,449	103,484,855
7/16/2018	140.98	142.13	136.66	141.41	26725400	739,494,449	104,571,913
7/23/2018	141.60	149.04	141.40	148.56	22170700	739,494,449	109,859,294
7/30/2018	148.03	151.50	147.00	149.78	14283200	739,494,449	110,761,478
8/6/2018	149.50	150.84	147.46	148.84	11298400	739,494,449	110,066,351
8/13/2018	148.84	151.10	147.52	149.46	16641500	739,494,449	110,524,846
8/20/2018	150.22	151.97	149.57	150.13	13551600	739,494,449	111,020,305
8/27/2018	151.35	153.72	149.00	150.62	16513300	739,494,449	111,382,650
9/3/2018	149.81	156.60	149.71	155.10	21174600	739,494,449	114,695,593
9/10/2018	155.94	157.95	154.82	157.41	17874700	739,494,449	116,403,824
9/17/2018	157.50	165.63	156.27	164.99	39147500	739,494,449	122,009,193
9/24/2018	164.48	164.84	162.30	162.83	20828700	739,494,449	120,411,883
10/1/2018	164.41	164.98	162.41	163.77	16364000	739,494,449	121,107,009
10/8/2018	163.23	164.88	150.36	152.65	26881800	739,494,449	112,883,823
10/15/2018	153.00	154.53	146.59	148.70	31649400	736,790,118	109,560,688
10/22/2018	146.70	147.38	135.81	142.74	35746000	736,790,118	105,169,425
10/29/2018	144.68	149.98	139.32	148.56	23989200	736,790,118	109,457,538
11/5/2018	149.31	153.30	148.35	150.25	21507100	736,790,118	110,702,715
11/12/2018	150.51	152.94	146.64	151.42	16458800	736,790,118	111,564,758
11/19/2018	150.36	151.38	140.97	143.54	18107300	736,790,118	105,758,848
11/26/2018	144.03	154.37	142.09	153.78	23319100	736,790,118	113,303,584
12/3/2018	157.00	159.63	146.88	147.45	20016300	736,790,118	108,639,701
12/10/2018	146.40	151.15	141.86	142.57	22761200	736,790,118	105,044,172
12/17/2018	142.08	142.64	132.28	132.54	24173000	736,790,118	97,654,157
12/24/2018	132.53	138.58	128.08	136.78	12199700	736,790,118	100,778,152

Note: Capitalization calculated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

Total Market Value for CSX, KSU, NSC, and UNP combined

Based on close price on last trading day of week and shares outstanding from 10-K and 10-Q.

Days For Week (actual trading days)		Capitalization	Holiday (M or F)
Beginning	End	(\$000)	
1. Tuesday, January 2, 2018	Friday, January 5, 2018	\$214,150,473	New Year's Day
2. Monday, January 8, 2018	Friday, January 12, 2018	\$219,673,073	
3. Tuesday, January 16, 2018	Friday, January 19, 2018	\$217,226,555	Martin Luther King Day
4. Monday, January 22, 2018	Friday, January 26, 2018	\$212,313,634	
5. Monday, January 29, 2018	Friday, February 2, 2018	\$202,370,199	
6. Monday, February 5, 2018	Friday, February 9, 2018	\$194,289,389	
7. Monday, February 12, 2018	Friday, February 16, 2018	\$206,154,505	
8. Tuesday, February 20, 2018	Friday, February 23, 2018	\$206,444,075	Washington's Birthday
9. Monday, February 26, 2018	Friday, March 2, 2018	\$199,134,730	
10. Monday, March 5, 2018	Friday, March 9, 2018	\$211,278,774	
11. Monday, March 12, 2018	Friday, March 16, 2018	\$207,623,353	
12. Monday, March 19, 2018	Friday, March 23, 2018	\$199,647,598	
13. Monday, March 26, 2018	Thursday, March 29, 2018	\$204,071,507	Good Friday
14. Monday, April 2, 2018	Friday, April 6, 2018	\$196,832,228	
15. Monday, April 9, 2018	Friday, April 13, 2018	\$202,358,753	
16. Monday, April 16, 2018	Friday, April 20, 2018	\$207,176,650	
17. Monday, April 23, 2018	Friday, April 27, 2018	\$209,539,977	
18. Monday, April 30, 2018	Friday, May 4, 2018	\$207,506,153	
19. Monday, May 7, 2018	Friday, May 11, 2018	\$219,223,701	
20. Monday, May 14, 2018	Friday, May 18, 2018	\$220,842,173	
21. Monday, May 21, 2018	Friday, May 25, 2018	\$223,079,658	
22. Tuesday, May 29, 2018	Friday, June 1, 2018	\$225,431,614	Memorial Day
23. Monday, June 4, 2018	Friday, June 8, 2018	\$224,811,443	
24. Monday, June 11, 2018	Friday, June 15, 2018	\$226,578,117	
25. Monday, June 18, 2018	Friday, June 22, 2018	\$221,587,392	
26. Monday, June 25, 2018	Friday, June 29, 2018	\$218,457,125	
27. Monday, July 2, 2018	Friday, July 6, 2018	\$220,212,244	
28. Monday, July 9, 2018	Friday, July 13, 2018	\$214,603,220	
29. Monday, July 16, 2018	Friday, July 20, 2018	\$220,892,487	
30. Monday, July 23, 2018	Friday, July 27, 2018	\$229,257,415	
31. Monday, July 30, 2018	Friday, August 3, 2018	\$231,845,991	
32. Monday, August 6, 2018	Friday, August 10, 2018	\$232,134,310	
33. Monday, August 13, 2018	Friday, August 17, 2018	\$234,340,460	
34. Monday, August 20, 2018	Friday, August 24, 2018	\$235,713,037	
35. Monday, August 27, 2018	Friday, August 31, 2018	\$235,598,793	
36. Tuesday, September 4, 2018	Friday, September 7, 2018	\$239,585,016	Labor Day
37. Monday, September 10, 2018	Friday, September 14, 2018	\$241,723,703	
38. Monday, September 17, 2018	Friday, September 21, 2018	\$249,109,128	
39. Monday, September 24, 2018	Friday, September 28, 2018	\$246,124,768	
40. Monday, October 1, 2018	Friday, October 5, 2018	\$245,355,528	
41. Monday, October 8, 2018	Friday, October 12, 2018	\$228,943,963	
42. Monday, October 15, 2018	Friday, October 19, 2018	\$222,365,852	
43. Monday, October 22, 2018	Friday, October 26, 2018	\$215,336,041	
44. Monday, October 29, 2018	Friday, November 2, 2018	\$224,299,939	
45. Monday, November 5, 2018	Friday, November 9, 2018	\$227,171,446	
46. Monday, November 12, 2018	Friday, November 16, 2018	\$229,990,583	
47. Monday, November 19, 2018	Friday, November 23, 2018	\$219,306,851	
48. Monday, November 26, 2018	Friday, November 30, 2018	\$231,614,271	
49. Monday, December 3, 2018	Friday, December 7, 2018	\$218,830,087	
50. Monday, December 10, 2018	Friday, December 14, 2018	\$211,555,165	
51. Monday, December 17, 2018	Friday, December 21, 2018	\$197,663,347	
52. Monday, December 24, 2018	Friday, December 28, 2018	\$203,231,097	
Average		\$219,319,376.74	

Market Value for Common Equity

List of U.S. Stock Market Full-Day Holidays in 2018

Day	Holiday
1. Monday, January 1, 2018	New Year's Day
2. Monday, January 15, 2018	Martin Luther King Jr. Day
3. Monday, February 19, 2018	Washington's Birthday
4. Friday, March 30, 2018	Good Friday
5. Monday, May 28, 2018	Memorial Day
6. Wednesday, July 4, 2018	Independence Day
7. Monday, September 3, 2018	Labor Day
8. Thursday, November 22, 2018	Thanksgiving Day
9. Wednesday, December 5, 2018	George H.W. Bush Day of Mourning
10. Tuesday, December 25, 2018	Christmas Day

Historical Risk Free Rates and Market Risk Premiums

The Surface Transportation Board (STB) has used a Capital Asset Pricing Model (CAPM) as part of its cost of capital determination since 2006. Two major components of the STB's CAPM are the Risk-Free Rate, which is based on 20-Year U.S. Government Bonds, and the Market Risk Premium (a.k.a. Equity Risk Premium), as calculated by Ibbotson Associates using data beginning in 1926. The table below lists the rates used by the STB (since 2006), the rate for the current year, and earlier rates that would have been used as part of the current STB specifications.

Year	Risk-Free Rate	Market Risk Premium
1980	11.36 %	7.60 %
1981	13.72	7.20
1982	12.92	7.20
1983	11.34	7.30
1984	12.49	7.10
1985	10.97	7.30
1986	7.84	7.40
1987	n.a.	7.20
1988	n.a.	7.20
1989	n.a.	7.50
1990	n.a.	7.20
1991	n.a.	7.40
1992	n.a.	7.30
1993	6.29	7.20
1994	7.49	7.00
1995	6.95	7.40
1996	6.83	7.50
1997	6.69	7.80
1998	5.72	8.00
1999	6.20	8.10
2000	6.23	7.80
2001	5.63	7.40
2002	5.43	7.00
2003	4.96	7.20
2004	5.04	7.20
2005	4.64	7.10
2006	5.00	7.13
2007	4.91	7.05
2008	4.36	6.47
2009	4.11	6.67
2010	4.03	6.72
2011	3.62	6.62
2012	2.54	6.70
2013	3.12	6.96
2014	3.07	7.00
2015	2.55	6.90
2016	2.22	6.94
2017	2.65	7.07
2018	3.02	6.91

Sources: Federal Reserve Board for U.S. government 20-year bonds (Risk-Free Rate) and Morningstar's *Ibbotson S&P Valuation Yearbook* Table A-1 for Market Risk Premiums through 2012. Morningstar's *Ibbotson S&P Classic Yearbook* is the source for premiums beginning 2013. The Duff & Phelps *Valuation Handbook Guide to Cost of Capital* is the source for premiums in 2015 and 2016. Values for 2017 & 2018 are from the Duff & Phelps online Cost of Capital Navigator. 2006 through 2017 match decisions by the STB. The U.S. Government did not issue 20-Year bonds in 1987 through 1992.

Historical Risk Free Rates and Market Risk Premiums

The Surface Transportation Board (STB) has always used a **long-term** equity risk premium (a.k.a. market risk premium) for its Capital Asset Pricing Model, and Duff & Phelps has been the source used in recent years. Duff & Phelps calculates this premium using the same method as the earlier source used by the STB, Morningstar/Ibbotson as found in its Ibbotson *S&P Valuation Yearbook*. The portion of the page shown below is from the Duff & Phelps 2019 *Cost of Capital Navigator*, page 14 of Chapter 5 (downloaded 3/11/2019). The latest long-term equity risk premium, as shown below, is **6.91 percent**. The years used for this calculation are 1926 through 2018.

- Three industry risk premia calculated, using different ERP estimates.^{5.15}

Long-term, "historical" (i.e., realized) ERP: As of the end of 2018, the long-horizon historical equity risk premium was 6.91%.^{5.16}

Long-term "supply-side" ERP: As of the end of 2018, the long-horizon supply-side equity risk premium was 6.14%.^{5.17}

Duff & Phelps Recommended ERP: As of the end of 2018, the Duff & Phelps recommended ERP is 5.5% (developed in conjunction with a "normalized" long-term risk-free rate of 3.5%).^{5.18}

The industry risk premia previously published in Table 3-5 of the *S&P Valuation Yearbook* were full-information betas converted to industry risk premia using only the long-term "historical" ERP in Formula 5.5. Duff & Phelps also calculates industry risk premia using the long-term "historical" ERP. These industry risk premia are equivalent to the ones previously published in Table 3-5 of the former *S&P Valuation Yearbook*.

In recognition that valuation analysts may use different ERP estimates, industry risk premia may be calculated using additional ERP estimates provided in the *Cost of Capital Navigator* like (i) the long-term "supply-side" ERP, and (ii) the Duff & Phelps Recommended ERP.

^{5.15} The industry risk premia previously published in Table 3-5 of the Ibbotson Associates/Morningstar *S&P Valuation Yearbook* were full-information betas converted to industry risk premia using only the "historical" long-term equity risk premium.

^{5.16} Calculated as the average annual return of the S&P 500 total return index minus the average annual return of the S&P long-term (20-year) government bond income return series over the 1926–2018 time period. The long-horizon historical equity risk premium was previously published on the "back page" of the Ibbotson Associates/Morningstar *S&P Valuation Yearbook* (discontinued).

^{5.17} The supply-side equity risk premium was also previously published on the "back page" of the Ibbotson Associates/Morningstar *S&P Valuation Yearbook* (discontinued).

^{5.18} To learn more about cost of capital issues, and to ensure that you are using the most recent Duff & Phelps Recommended ERP, visit www.duffandphelps.com/CostofCapital.

AAR Regression for 2018 Beta

AAR Regression for 2018 Beta 16:52 Wednesday, March 20, 2019 65
STB-Style 5-Year Beta using SP 500 Price Index, Weighted RR Returns, 90-Day T-Bill as RF
CSX, KSU, NSC, and UNP
This data set (04) uses Yahoo Daily data converted to weekly with corrections to NSC and UNP P-Adj for Dividend issues

The GLM Procedure

Dependent Variable: ZRR

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.001327415	0.00134726	0.99	0.3254
ZSP5	1.111998624	0.07547448	14.73	<.0001

Cost of Common Equity using the Multi-Stage Discounted Cash Flow Model

The cost of equity for each firm (r_i) in the Surface Transportation Board's interpretation of the Morningstar/Ibbotson three-stage DCF model is the solution to the following equation:¹

$$MV_{i0} = \sum_{t=1}^5 \frac{CF_{i0}(1+g_{i1})^t}{(1+r_i)^t} + \sum_{t=6}^{10} \frac{CF_{i5}(1+g_{i2})}{(1+r_i)^t} + \frac{IBEI_{i10}(1+g_{i3})}{(1+r_i)^{10} (r_i - g_{i3})},$$

where

MV_{i0} = market value of equity for firm i in year 0 (i.e., the year for which the cost of equity is being estimated);

CF_{it} = average cash flow for firm i at the end of year t ;

g_{ij} = earnings growth rate for firm i in stage j ($j = 1, 2$, or 3);

r_i = the cost of equity for firm i ; and

$IBEI_{10} = IBEI_0(1+g_1)^5(1+g_2)^5$.

Note that $IBEI_0$ is determined by the same process as CF_0 (See Table 13 in text).

¹ *Cost of Capital Yearbook*, 2008, Morningstar, Inc., p. 24.

Cash Flow Calculation

CSX, Corp.	1	2	3	4	5	Total
	2014	2015	2016	2017	2018	
(\$ in millions)						
Revenue	12,669	11,811	11,069	11,408	12,250	59,207
Net Income	1,927	1,968	1,714	1,840	3,309	10,758
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,151	1,208	1,301	1,315	1,331	6,306
Deferred Taxes	298	456	405	209	279	1,647
Capital Expenditures	2,449	2,562	2,398	2,040	1,745	11,194
Cash Flow	927	1,070	1,022	1,324	3,174	7,517
Cash Flow / Revenue	0.07317	0.09059	0.09233	0.11606	0.25910	0.12696
NIBEI / Revenue	0.15210	0.16662	0.15485	0.16129	0.27012	0.18170

Ibbotson Smoothed Cash Flow = \$12,250 x 0.12696 = **\$1,555.28**

Ibbotson Smoothed Net Income BEI = \$12,250 x 0.18170 = **\$2,225.84**

2017 Data

Net Income as reported to SEC	\$5,471
Net Income as requested by STB	1,840
Deferred Taxes as reported to SEC	-3,233
Deferred Taxes as requested by STB	209

Cash Flow Calculation

Kansas City Southern	1	2	3	4	5	Total
	2014	2015	2016	2017	2018	
(\$ in millions)						
Revenue	2,577.1	2,418.8	2,334.2	2,582.9	2,714.0	12,627
Net Income	502.4	483.3	477.9	474.2	627.2	2,565
Extraordinary Items	0.0	0.0	0.0	0.0	0.0	0
Depreciation	258.1	284.6	305.0	320.9	346.7	1,515
Deferred Taxes	140.1	135.8	104.8	186.3	91.7	659
Capital Expenditures	997.0	849.6	623.3	654.0	645.3	3,769
Cash Flow	-96	54	264	327	420	970
Cash Flow / Revenue	-0.03741	0.02237	0.11327	0.12676	0.15486	0.07680
NIBEI / Revenue	0.19495	0.19981	0.20474	0.18359	0.23110	0.20314
Ibbotson Smoothed Cash Flow = \$2,714 x 0.07680 =					\$208.45	
Ibbotson Smoothed Net Income BEI = \$2,714 x 0.20314 =					\$551.31	

Note: Net Income is net available to common stockholders after preferred dividends and non-KCS portion of Meridian Speedway.

Capital Expenditures

Core CapX	668.2	688.0	563.6	585.4	520.3
Special programs	302.1	144.2	26.6	42.6	98.9
Meridian Speedway	26.7	17.4	33.1	26.0	26.1
Meridian, Otr RR	0.0	0.0	0.0		
Total CapX	997.0	849.6	623.3	654.0	645.3

2017 Data

Net Income as reported to SEC	\$961.8
Net Income as requested by STB	\$474.2
Deferred Taxes as reported to SEC	-\$301.3
Deferred Taxes as requested by STB	\$186.3

Cash Flow Calculation

Norfolk Southern	1	2	3	4	5	Total
	2014	2015	2016	2017	2018	
(\$ in millions)						
Revenue	11,624	10,511	9,888	10,551	11,458	54,032
Net Income	2,000	1,556	1,668	1,922	2,666	9,812
Extraordinary Items	0	0	0	0	0	0
Depreciation	956	1,059	1,030	1,059	1,104	5,208
Deferred Taxes	294	320	227	477	227	1,545
Capital Expenditures	2,118	2,385	1,887	1,723	1,951	10,064
Cash Flow	1,132	550	1,038	1,735	2,046	6,501
Cash Flow / Revenue	0.09738	0.05233	0.10498	0.16444	0.17857	0.12032
NIBEI / Revenue	0.17206	0.14804	0.16869	0.18216	0.23268	0.18160

Ibbotson Smoothed Cash Flow = \$11,458 x 0.12032 = **\$1,378.60**

Ibbotson Smoothed Net Income BEI = \$11,458 x 0.18160 = **\$2,080.73**

2017 Data

Net Income as reported to SEC	\$5,404
Net Income as requested by STB	1,922
Deferred Taxes as reported to SEC	-2,859
Deferred Taxes as requested by STB	477

Cash Flow Calculation

Union Pacific Corp.	1	2	3	4	5	Total
	2014	2015	2016	2017	2018	
(\$ in millions)						
Revenue	23,988	21,813	19,941	21,240	22,832	109,814
Net Income	5,180	4,772	4,233	4,638	5,966	24,789
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,904	2,012	2,038	2,105	2,191	10,250
Deferred Taxes	895	765	831	868	338	3,697
Capital Expenditures	4,346	4,650	3,505	3,238	3,437	19,176
Cash Flow	3,633	2,899	3,597	4,373	5,058	19,560
Cash Flow / Revenue	0.15145	0.13290	0.18038	0.20589	0.22153	0.17812
NIBEI / Revenue	0.21594	0.21877	0.21228	0.21836	0.26130	0.22574

Ibbotson Smoothed Cash Flow = \$22,832 x 0.17812 = **\$4,066.82**

Ibbotson Smoothed Net Income BEI = \$22,832 x 0.22574 = **\$5,154.01**

2017 Data

Net Income as reported to SEC	\$10,712
Net Income as requested by STB	4,638
Deferred Taxes as reported to SEC	-5,067
Deferred Taxes as requested by STB	868

2018 Median Growth Rates for MSDCF

Company	Analyst Growth Rates from IBES December 31								Median
	Rate 1	Rate 2	Rate 3	Rate 4	Rate 5	Rate 6	Rate 7	Rate 8	
CSX	18.30	27.43	12.00	28.80	29.53	--	--	--	27.43
KSU	15.71	13.68	--	--	--	--	--	--	14.70
NSC	14.30	19.86	15.00	17.40	19.30	--	--	--	17.40
UNP	21.24	12.00	17.90	20.20	19.99	--	--	--	19.99

Simple Average of Medians = 19.88 percent.

2018 Median Growth Rates for MSDCF CSX

Detail Estimates - Period Summary

Enter RIC :

CSX

CSX Corp

Measure :

Earnings Per Share

Long Term Growth

Period :

Currency: USD (in millions except for per share items)

	Ests	Mean	High	Low		12/2017\	3/2018\	6/2018\	9/2018\	12/2017A
Earnings Per Share	\$	23.21	29.53	12.00	Reported	0.64	0.78	1.01	1.05	2.30
Filtered/Preliminary Mean**:	L	18.30	18.30	18.30	Surprise Mean	0.56	0.66	0.87	0.95	2.21
30 Day Ago Mean	\$	22.70	28.80	12.00	Surprise (%)	13.74	18.90	16.69	10.90	3.88
* Only selected brokers below are included in the filtered mean										

Check/U ncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✓	Permission Denied 54992	Permission Denied	18.30	Jul 17, 18	13.80	Jan 16, 18	Jul 17, 18
	CREDIT SUISSE	Landry, Allison M	27.43	Oct 17, 18	26.98	Oct 12, 18	Dec 26, 18
	Permission Denied 32	Permission Denied	12.00	Apr 19, 17	10.00	Apr 13, 16	Dec 24, 18
	Permission Denied 398136	Permission Denied	28.80	Oct 17, 18	28.30	Jul 18, 18	Oct 17, 18
	Permission Denied 392	Permission Denied	29.53	Dec 02, 18	26.97	Oct 17, 18	Dec 02, 18

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12/28/2018

2018 Median Growth Rates for MSDCF KSU

Detail Estimates - Period Summary										
Enter RIC :		KSU	Kansas City Southern							
Measure :		Earnings Per Share	Period :		Long Term Growth		Currency: USD (in millions except for per share items)			
			Est	Mean	High	Low	Reported	12/2017\	3/2018\	6/2018\
Earnings Per Share		2	14.70	15.71	15.71	13.68	1.38	1.30	1.54	1.57
Filtered/Preliminary Mean**:		1	15.71	15.71	15.71	15.71	1.37	1.33	1.51	1.57
30 Day Ago Mean		3	13.59	15.71	15.71	11.70	1.10	-2.15	1.65	0.18
							Surprise (%)			0.65
* Only selected brokers below are included in the filtered mean										
Check/U ncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date			
✓	CREDIT SUISSE	Landry, Allison M	15.71	Oct 22, 18	16.01	Oct 12, 18	Dec 26, 18			
	Permission Denied 392	Permission Denied	13.68	Dec 03, 18	12.00	Jun 14, 18	Dec 03, 18			

2018 Median Growth Rates for MSDCF NSC



Detail Estimates - Period Summary

Enter RIC :

NSC

Norfolk Southern Corp

Measure :

Earnings Per Share

Long Term Growth

Period :

Currency: USD (in millions except for per share items)

	Est	Mean	High	Low		12/2017\	3/2018\	6/2018\	9/2018\	12/2017A
Earnings Per Share	\$	17.17	19.86	14.30	Reported	1.69	1.93	2.50	2.52	6.61
Filtered/Preliminary Mean**:	1	14.30	14.30	14.30	Surprise Mean	1.57	1.77	2.33	2.44	6.50
30 Day Ago Mean	\$	17.17	19.86	14.30	Surprise (%)	7.69	9.00	7.42	3.13	1.66

* Only selected brokers below are included in the filtered mean

Check/U ncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✓	Permission Denied 54992	Permission Denied	14.30	Jul 25, 18	13.20	Jan 24, 18	Jul 25, 18
	CREDIT SUISSE	Landry, Allison M	19.86	Oct 24, 18	18.60	Oct 12, 18	Dec 26, 18
	Permission Denied 32	Permission Denied	15.00	Apr 13, 16	NA	NA	Nov 14, 18
	Permission Denied 398136	Permission Denied	17.40	Jul 16, 18	17.00	Apr 25, 18	Jul 16, 18
	Permission Denied 392	Permission Denied	19.30	Oct 25, 18	8.00	Oct 08, 88	Dec 02, 18

Thomson Reuters – Eikon

12/28/2018

2018 Median Growth Rates for MSDCF UNP

Detail Estimates - Period Summary									
Enter RIC :		UNP		Union Pacific Corp					
Measure :		Earnings Per Share		Long Term Growth		Currency: USD (in millions except for per share items)			
		Ests	Mean	High	Low		12/2017\	3/2018\	6/2018\
Earnings Per Share		5	18.27	21.24	12.00	Reported	1.53	1.68	1.98
Filtered/Preliminary Mean**:		1	21.24	21.24	21.24	Surprise Mean	1.54	1.66	1.95
30 Day Ago Mean		5	18.27	21.24	12.00	Surprise (%)	-0.82	1.33	1.54
							2.15	2.10	5.79
							2.58	-0.25	
* Only selected brokers below are included in the filtered mean									
Check/U ncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date		
✓	CREDIT SUISSE	Landry, Allison M	21.24	Oct 25, 18	20.58	Oct 12, 18	Dec 26, 18		
	WELLS FARGO SECURITIES, LLC	Deak, Casey S	12.00	Apr 30, 18	15.00	Dec 16, 09	Jul 24, 18		
	Permission Denied 54992	Permission Denied	17.90	Oct 25, 18	17.50	Jul 19, 18	Oct 25, 18		
	Permission Denied 398136	Permission Denied	20.20	Oct 25, 18	19.80	Jul 16, 18	Oct 25, 18		
	Permission Denied 392	Permission Denied	19.99	Oct 26, 18	20.55	Sep 26, 18	Dec 02, 18		

Stage 3 Growth Rate for MS-DCF Summary

The Surface Transportation Board's Multi-Stage Discounted Cash Flow model for estimating the cost of common equity uses 3 stages of growth. The third stage is the long-run nominal growth rate of the U.S. economy, and it is estimated by adding the long-term expected growth in output (represented by the historical growth rate for U.S. Real Gross Domestic Product since 1929) to the long-run expected U.S. inflation rate.

Long Term Expected Growth in Output		3.22 %
Historical Growth Rate for Real GDP, 1929-2018	(page 2)	
Long Term Expected Inflation Rate		<u>1.78</u>
Rate for Long-Term U.S. Government Bonds	2.87 (page 5)	
Rate for 20-year U.S. Inflation-Indexed Bonds	<u>1.09</u> (page 5)	
	1.78	
Stage 3 Growth Rate (real growth + inflation)		5.00 %

The purpose of this appendix is to replicate Morningstar's Stage 3 Growth Rate used by the Surface Transportation Board in its version of the Multi-Stage Discounted Cash Flow model used to estimate the cost of common equity for the railroad industry.

Morningstar's Ibbotson SBBI Valuation Yearbook has annually been used as a source for the Stage 3 growth rate of the Surface Transportation Board's Multi-Stage Discounted Cash Flow (MSDCF) model. On September 19, 2013, Morningstar customers were notified that the *SBBI Valuation Yearbook* was being discontinued, but much of the same data could be found in a different publication -- the *Ibbotson SBBI Classic Yearbook*.

Customer Service said **"We won't be publishing the long-term growth rate anymore, however it's pretty simple to calculate using data that will be in the Classic Yearbook and publicly available data."** They also said "Essentially, you would take the long-term government yield as of December (which would be included in the Classic Yearbook) and subtract the Treasury Real Yield for 20 year bonds as of the same date. This value is called the inflation estimate." "From there, you need the GDP growth rate, which you can calculate from the Current-dollar and "real" GDP link in the BEA website. Using the GDP in billions of chained 2005 dollars column, calculate an annual growth rate. One thing, however, is that we've always used GDP chained to 2005 dollars and it looks like they've since changed it to be chained to 2009 dollars. This may cause a slight change in the historical growth rates."

Beginning in 2016, Morningstar stopped publishing its Ibbotson SBBI Classic Yearbook. Calculations on page 5 of this appendix use 20-Year U.S. Treasury Bonds in lieu of the Ibbotson Long-Term Government Yields.

Stage 3 Growth Rate for MS-DCF Long-Term Expected Growth in Output

AAR Replicates Morningstar

	(a)	(b)	(c)	(d)
	GDP in billions of chained 2005 dollars	Years of Growth	AAR Calc. Growth Rate	SBBI Text Growth Rate
Year				
1929	976.1			
2009	12,757.9	80	3.27%	3.3%
2010	13,063.0	81	3.25%	3.3%
2011	13,299.1	82	3.24%	3.24%
2012	13,591.1	83	3.22%	3.22%

The Bureau of Economic Analysis rebased Real GDP from 2005 dollars to 2009 dollars, and may have revised recent year data. Therefore, GDP data in 2005 \$ were not available for 2013. Beginning in 2019, BEA began using 2012 dollars.

- (a) Real GDP in 2005 \$ - 2009-2012 are from the Economic Report of the President 2013, Table B-11
1929 is from BEA table dated August 2011
- (b) Year minus 1929 = number of years of growth from 1929 to year
- (c) Compound growth rate from 1929 to year
- (d) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.

AAR Calculates Growth Rate using GDP in 2012 dollars

	(e)	(f)	(g)	(h)
	GDP in billions of chained 2012 dollars	Years of Growth	AAR Calc. Growth Rate	AAR Calc. Growth Rate using 2009 \$
Year				
1929	1,109.4			
2011	15,840.7	82	3.30%	3.29%
2012	16,197.0	83	3.28%	3.28%
2013	16,495.4	84	3.27%	3.26%
2014	16,899.8	85	3.26%	3.25%
2015	17,386.7	86	3.25%	3.25%
2016	17,659.2	87	3.23%	3.22%
2017	18,050.7	88	3.22%	3.21%
2018	18,566.4	89	3.22%	

- (e) Real GDP in 2012 \$ downloaded from BEA 4/1/2019.
- (f) Year - 1929 = number of years of growth from 1929 to year
- (g) Compound growth rate from 1929 to year
- (h) Previous years' calculations used 2009 \$, which have now been discontinued. This column's purpose is only for comparison purposes.

Stage 3 Growth Rate for MS-DCF

Data Sources for Real GDP in 2005 \$

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GDP and Other Major NIPA Series

August 2011

Table 2A. Real Gross Domestic Product—Continues

(Billions of chained (2005) dollars; quarterly estimates are seasonally adjusted at annual rates)

Year and quarter	Gross domestic product	Personal consumption expenditures	Gross private domestic investment	Exports and imports of goods and services		Government consumption expenditures and gross investment	Residual	Final sales of domestic product	Gross domestic purchases	Final sales to domestic purchasers	Gross national product	Percent change from preceding period				
				Exports	Imports							Gross domestic product	Final sales of domestic product	Gross domestic purchases	Final sales to domestic purchasers	Gross national product
1929.....	976.1	736.3	101.4	37.9	49.1	146.5	3.1	986.8	994.1	1,005.2	984.6	.....	.....	.....	.....	.....
1930.....	892.0	696.8	67.6	31.3	42.7	161.4	-22.4	919.2	911.1	939.2	900.0	-8.6	-6.8	-8.4	-6.6	-8.6
1931.....	834.2	674.9	42.5	26.1	37.2	168.2	-40.3	865.2	853.9	885.9	840.7	-6.5	-5.9	-6.3	-5.7	-6.6
1932.....	725.2	614.4	12.8	20.4	30.9	162.6	-54.1	766.6	743.9	786.5	730.5	-13.1	-11.4	-12.9	-11.2	-13.1
1933.....	715.8	600.8	18.9	20.5	32.2	157.2	-49.4	743.2	735.1	763.4	720.3	-1.3	-3.1	-1.2	-2.9	-1.4
1934.....	793.7	643.7	34.1	22.8	32.9	177.3	-51.3	814.0	812.7	833.7	797.7	10.9	9.5	10.6	9.2	10.7
1935.....	864.2	683.0	63.1	24.1	43.1	182.2	-45.1	864.5	892.2	892.7	868.9	8.9	6.2	9.8	7.1	8.9
1936.....	977.0	752.5	80.9	25.3	42.6	242.6	-51.7	978.9	1,006.1	1,008.1	981.1	13.1	13.2	12.8	12.9	12.9
1937.....	1,027.1	780.4	101.1	31.9	47.9	203.6	-42.0	1,019.8	1,052.9	1,045.5	1,032.5	5.1	4.2	4.7	3.7	5.2
1938.....	994.8	767.8	66.8	31.5	37.3	216.3	-56.3	1,005.2	1,007.3	1,021.0	997.4	-3.4	-1.4	-4.3	-2.3	-3.4
1939.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.1	7.4	8.1	7.4	8.1

TABLE B-2. Real gross domestic product, 1964-2012

(Billions of chained (2005) dollars, except as noted; quarterly data at seasonally adjusted annual rates)

Year or quarter	Gross domestic product	Personal consumption expenditures			Gross private domestic investment			
		Total	Goods	Services	Total	Fixed investment		
						Total	Nonresidential	
							Total	Structures
1964.....	3,389.4	2,107.5	.....	.....	382.1	.....	.....	.....
1965.....	3,607.0	2,240.8	.....	.....	435.7	.....	.....	.....
1966.....	3,842.1	2,367.9	.....	.....	474.1	.....	.....	.....
1967.....	3,939.2	2,438.8	.....	.....	452.4	.....	.....	.....
1968.....	4,129.9	2,579.6	.....	.....	478.7	.....	.....	.....
1969.....	4,258.2	2,676.2	.....	.....	506.6	.....	.....	.....
1970.....	4,266.3	2,738.9	.....	.....	473.4	.....	.....	.....
1971.....	4,408.5	2,843.3	.....	.....	527.3	.....	.....	.....
1972.....	4,643.8	3,018.1	.....	.....	589.8	.....	.....	.....
1973.....	4,912.8	3,157.7	.....	.....	658.9	.....	.....	.....
1974.....	4,885.7	3,141.4	.....	.....	610.3	.....	.....	.....
1975.....	4,875.4	3,212.6	.....	.....	502.2	.....	.....	.....
1976.....	5,136.9	3,391.5	.....	.....	603.7	.....	.....	.....
1977.....	5,373.1	3,534.3	.....	.....	694.9	.....	.....	.....
1978.....	5,672.8	3,680.1	.....	.....	778.7	.....	.....	.....
1979.....	5,850.1	3,777.8	.....	.....	803.5	.....	.....	.....
1980.....	5,834.0	3,764.5	.....	.....	715.2	.....	.....	.....
1981.....	5,982.1	3,821.6	.....	.....	779.6	.....	.....	.....
1982.....	5,865.9	3,874.9	.....	.....	670.3	.....	.....	.....
1983.....	6,130.9	4,096.4	.....	.....	732.8	.....	.....	.....
1984.....	6,571.5	4,313.6	.....	.....	948.7	.....	.....	.....
1985.....	6,843.4	4,538.3	.....	.....	939.8	.....	.....	.....
1986.....	7,080.5	4,722.4	.....	.....	933.5	.....	.....	.....
1987.....	7,307.0	4,868.0	.....	.....	962.2	.....	.....	.....
1988.....	7,607.4	5,064.3	.....	.....	984.9	.....	.....	.....
1989.....	7,879.2	5,207.5	.....	.....	1,024.4	.....	.....	.....
1990.....	8,027.1	5,313.7	.....	.....	989.9	.....	.....	.....
1991.....	8,008.3	5,321.7	.....	.....	909.4	.....	.....	.....
1992.....	8,280.0	5,503.2	.....	.....	983.1	.....	.....	.....
1993.....	8,516.2	5,698.6	.....	.....	1,070.9	.....	.....	.....
1994.....	8,863.1	5,916.2	.....	.....	1,216.4	.....	.....	.....
1995.....	9,086.0	6,076.2	1,896.0	4,208.5	1,254.3	1,231.2	787.9	342.0
1996.....	9,425.8	6,288.3	1,980.9	4,331.7	1,365.3	1,341.6	861.5	361.4
1997.....	9,845.9	6,520.4	2,075.3	4,445.3	1,535.2	1,465.4	965.5	387.9
1998.....	10,274.7	6,862.3	2,215.5	4,662.1	1,688.9	1,624.4	1,081.4	407.7
1999.....	10,770.7	7,237.6	2,392.0	4,853.1	1,837.6	1,775.5	1,194.3	408.2
2000.....	11,216.4	7,604.6	2,518.2	5,083.6	1,963.1	1,906.8	1,311.3	440.0
2001.....	11,337.5	7,810.3	2,597.3	5,219.1	1,825.2	1,870.7	1,274.8	433.3
2002.....	11,543.1	8,018.3	2,702.9	5,318.5	1,800.4	1,791.5	1,173.7	356.6
2003.....	11,836.4	8,244.5	2,827.2	5,418.2	1,870.1	1,854.7	1,189.6	343.0
2004.....	12,246.9	8,515.8	2,953.3	5,562.7	2,058.2	1,992.5	1,263.0	346.7
2005.....	12,623.0	8,803.5	3,076.7	5,726.8	2,172.3	2,122.3	1,347.3	351.8
2006.....	12,958.5	9,064.5	3,178.9	5,875.6	2,231.8	2,172.7	1,455.5	384.0
2007.....	13,206.4	9,262.9	3,273.5	5,990.2	2,159.5	2,130.6	1,550.0	438.2
2008.....	13,161.9	9,211.7	3,192.9	6,017.0	1,939.8	1,978.6	1,537.6	466.4
2009.....	12,757.9	9,032.6	3,098.2	5,930.6	1,458.1	1,602.2	1,259.8	368.1
2010.....	13,063.0	9,146.2	3,209.1	5,987.6	1,658.0	1,598.7	1,288.5	310.6
2011.....	13,299.1	9,426.8	3,331.0	6,101.5	1,744.0	1,704.5	1,378.2	319.2
2012 P.....	13,591.1	9,604.9	3,433.0	6,178.0	1,911.0	1,850.1	1,484.9	351.3

"Survey of Current Business", August 2011, U.S. Bureau of Economic Analysis

"Economic Report of the President", March 2013

Stage 3 Growth Rate for MS-DCF Data Sources for Real GDP in 2012 \$

Current-Dollar and "Real" Gross Domestic Product					28-Mar-19
Annual			Quarterly (Seasonally adjusted annual rates)		
	GDP in billions of current dollars	GDP in billions of chained 2012 dollars		GDP in billions of current dollars	GDP in billions of chained 2012 dollars
1929	104.6	1,109.4	1947Q1	243.2	2,033.1
1930	92.2	1,015.1	1947Q2	246.0	2,027.6
1931	77.4	950.0	1947Q3	249.6	2,023.5
1932	59.5	827.5	1947Q4	259.7	2,055.1
2011	15,542.6	15,840.7	1967Q3	865.2	4,581.3
2012	16,197.0	16,197.0	1967Q4	881.4	4,615.9
2013	16,784.9	16,495.4	1968Q1	909.4	4,710.0
2014	17,521.7	16,899.8	1968Q2	934.3	4,788.7
2015	18,219.3	17,386.7	1968Q3	950.8	4,825.8
2016	18,707.2	17,659.2	1968Q4	968.0	4,844.8
2017	19,485.4	18,050.7	1969Q1	993.3	4,920.6
2018	20,494.1	18,566.4	1969Q2	1,009.0	4,935.6

Download for Bureau of Economic Analysis web site. Middle years and some quarters omitted to enable data to fit on this page. Use the 2012 dollars column (annual), circled values.

Stage 3 Growth Rate for MS-DCF Long-Term Inflation Rate

Year	(a) Long-Term Gov. Yields		(c)	(d) Inflation Indexed		(e)	(f)	(g)
	From SBBI	Appendix	T-Bonds	20-Yr T-Bonds	20-Yr T-Bonds	Daily	Long Term Inflation Rate	AAR Calc
2008	3.0 %	3.03 %	3.05 %	2.4 %	2.36 %	0.6 %	0.67 %	
2009	4.6	4.58	4.58	2.0	2.03	2.6	2.55	
2010	4.1	4.14	4.13	1.6	1.59	2.6	2.55	
2011	2.48	2.48	2.57	0.53	0.53	1.95	1.95	
2012	2.41	2.41	2.54	0.15	0.15	2.26	2.26	
2013	n/a	3.67	3.72	n/a	1.36	n/a	2.31	
2014	n/a	2.40	2.47	n/a	0.68	n/a	1.72	
2015	n/a	n/a	2.67	n/a	1.07	n/a	1.60	
2016	n/a	n/a	2.79	n/a	0.82	n/a	1.97	
2017	n/a	n/a	2.58	n/a	0.61	n/a	1.97	
2018	n/a	n/a	2.87	n/a	1.09	n/a	1.78	

n/a = no longer available

Sources:

- (a) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.
- (b) SBBI Appendix B, Table B-9 (Long-Term Government Bonds), December
Beginning in 2014, data from Ibbotson® SBBI® Classic Yearbook (Classic Yearbook).
2013 is from Table 2-2 of the Classic Yearbook, on page 42. The 2013 and 2014
numbers are also found in the Ibbotson SBBI Market Report with data as of December,
in Table 3 on page 9.
- (c) Treasury Constant Maturities, Nominal, 20-Year, Business Day, last day of year
<https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15> (See workpapers)
- (d) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.
- (e) Treasury Constant Maturities, Inflation Indexed, 20-Year, Business Day,
last (business) day of year
<https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15> (See workpapers)
- (f) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.
- (g) Column (b) less column (e) except for 2015, 2016, and 2017, which is column (c)
less column (e)

List of Stage 3 Growth Rates for MS-DCF

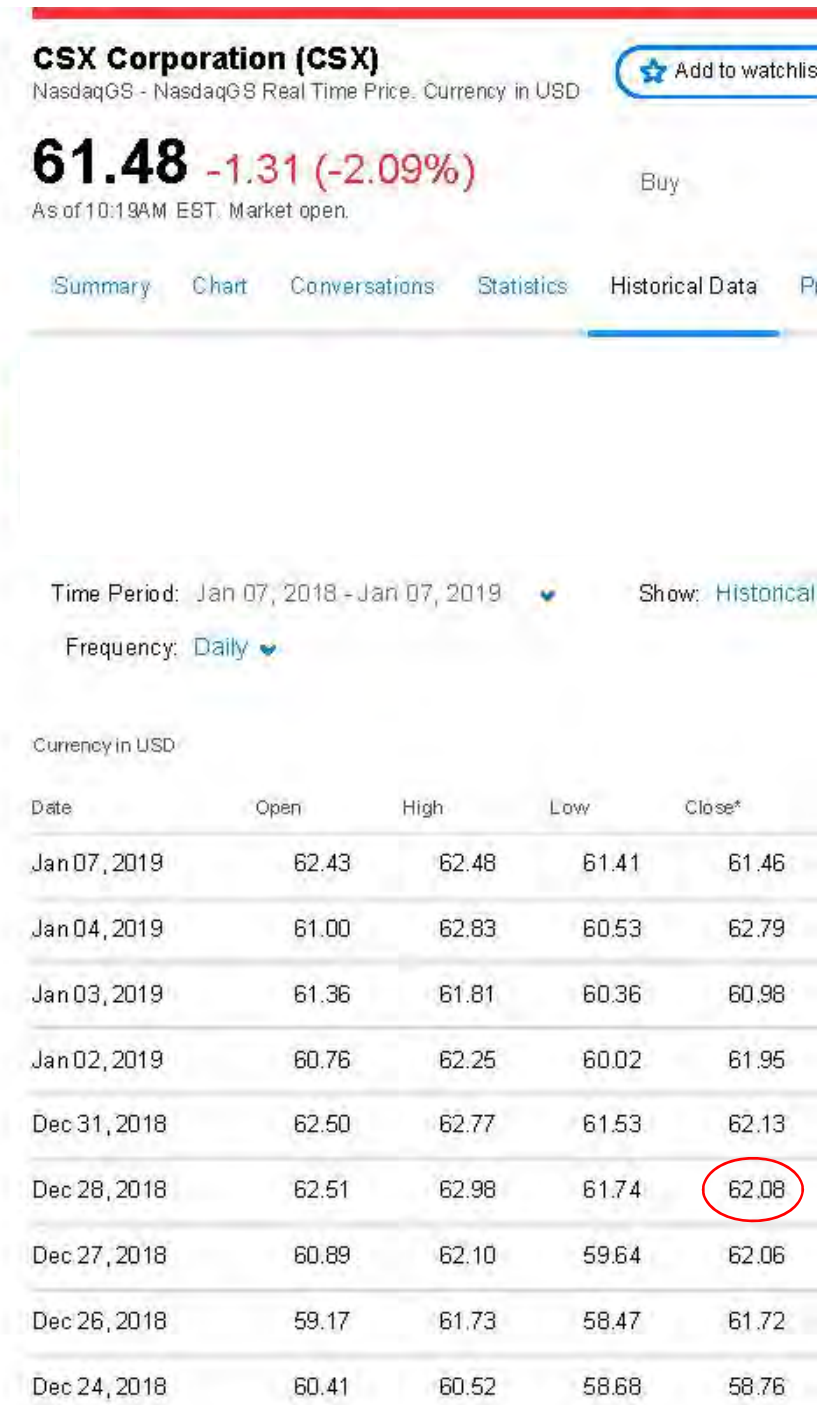
The Surface Transportation Board's Multi-Stage Discounted Cash Flow model for estimating the cost of common equity uses 3 stages of growth. The third stage is the long-run nominal growth rate of the U.S. economy, and it is estimated by adding the long-term expected real growth in output (represented by the historical growth rate for U.S. Real Gross Domestic Product since 1929) to the long-run expected U.S. inflation rate. Listed below are the rates used by the Board since it began using the MSDCF in the 2008 Cost of Capital determination, plus the numbers calculated for 2018.

Year	Long-Term Expected		Stage 3 Growth Rate
	Real Growth in Output	Inflation Rate	
2008	3.3 %	0.6 %	3.90 %
2009	3.3	2.6	5.80
2010	3.3	2.6	5.80
2011	3.24	1.95	5.19
2012	3.22	2.26	5.48
2013	3.27	2.31	5.58
2014	3.26	1.72	4.98
2015	3.24	1.60	4.84
2016	3.22	1.97	5.19
2017	3.21	1.97	5.18
2018	3.22 %	1.78 %	5.00 %

Notes:

The Stage 3 Growth Rate for years 2008 through 2012 are from the Ibbotson SBBI Valuation Yearbooks for those years. Ibbotson displayed 1 digit after the decimal for years 2008 through 2010 for the long-term expected growth rate in output and inflation rate. Figures for 2009 and 2010 rounded to the same numbers.

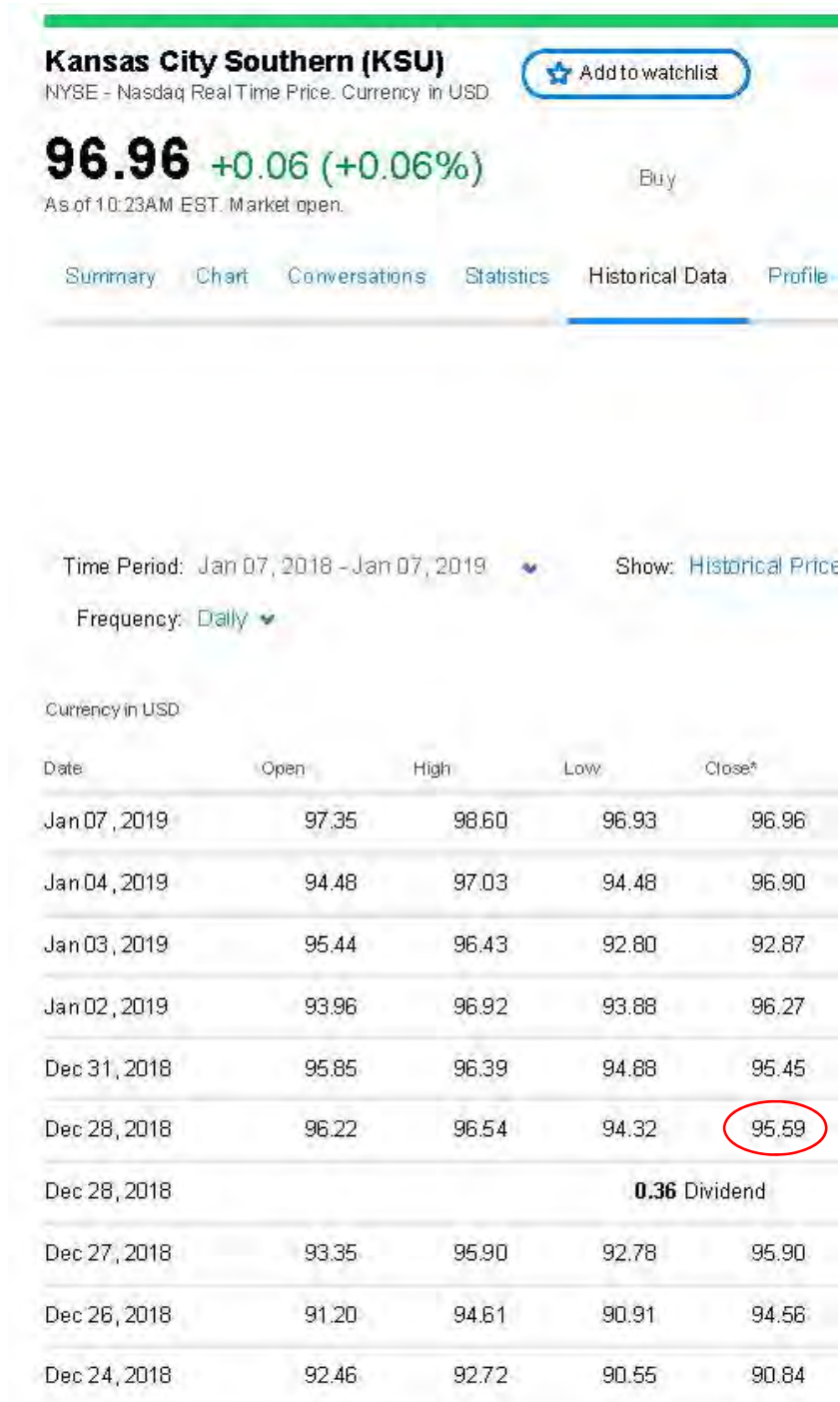
Market Value Data for MSDCF Stock Price for CSX - End of 2018



Retrieved January 7, 2019.

Link to web page: <http://finance.yahoo.com/quote/CSX/history>

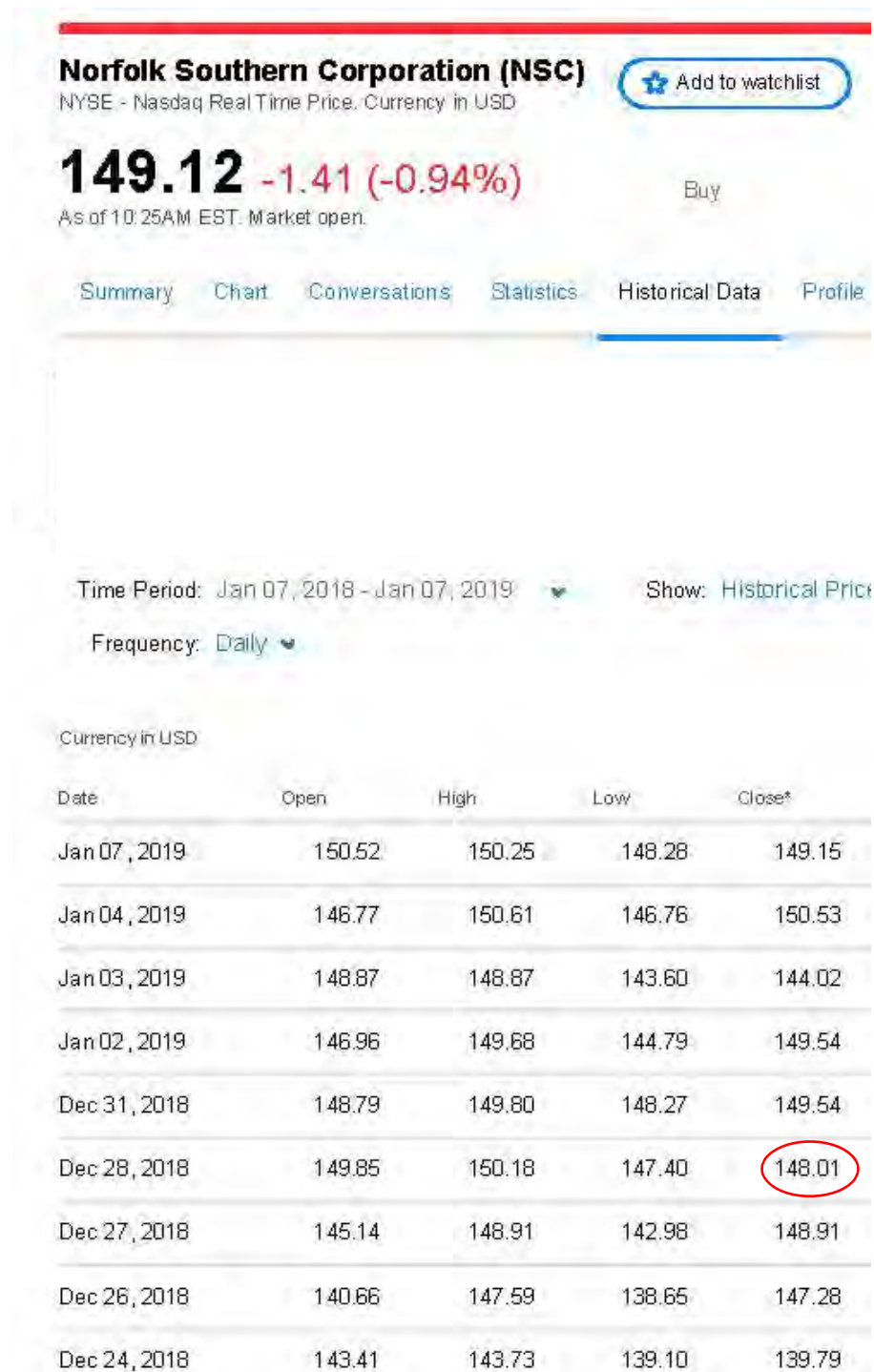
Market Value Data for MSDCF Stock Price for KSU - End of 2018



Retrieved January 7, 2019.

Link to web page: <http://finance.yahoo.com/quote/KSU/history>

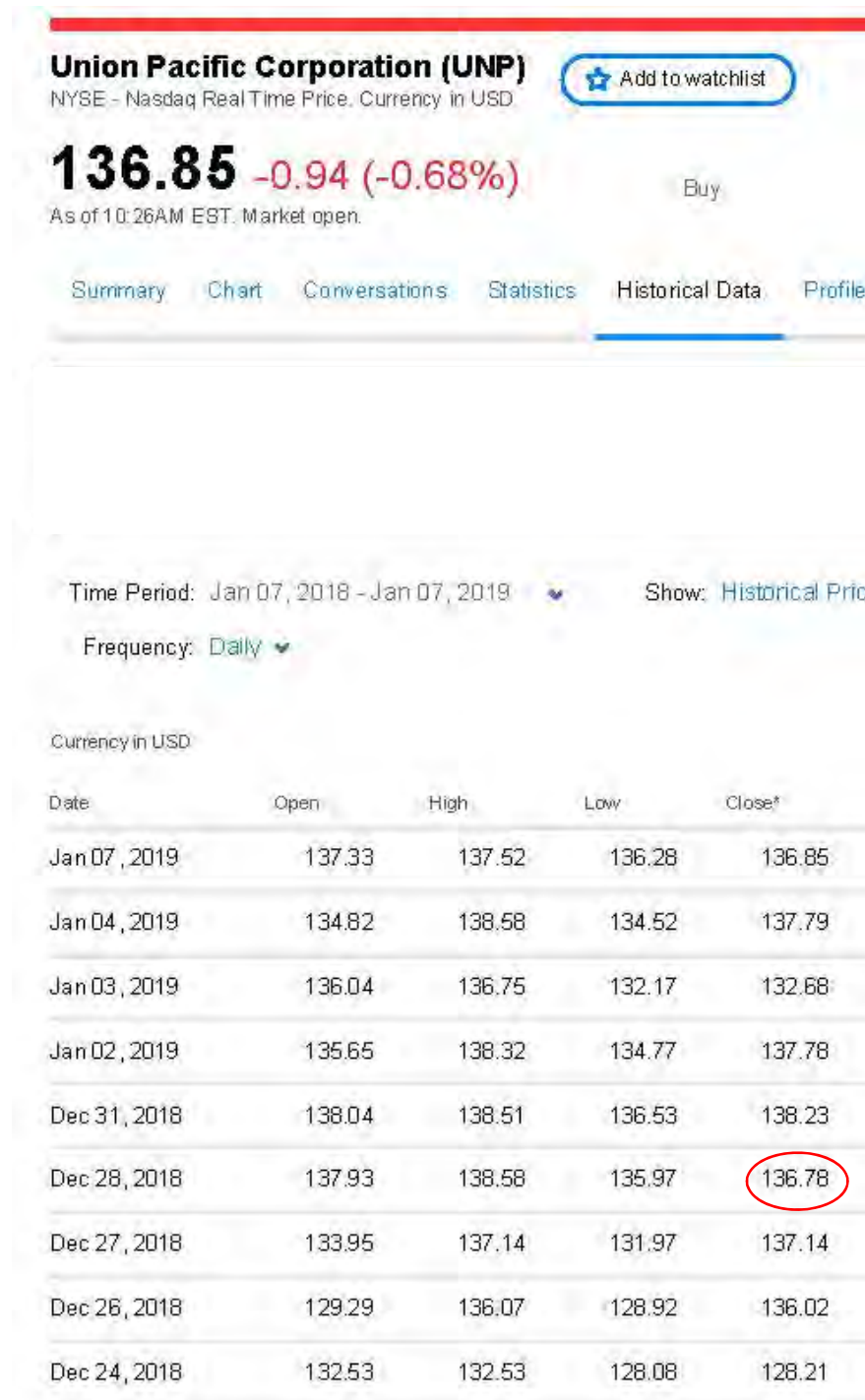
Market Value Data for MSDCF Stock Price for NSC - End of 2018



Retrieved January 7, 2019.

Link to web page: <http://finance.yahoo.com/quote/NSC/history>

Market Value Data for MSDCF Stock Price for UNP - End of 2018



Retrieved January 7, 2019.

Link to web page: <http://finance.yahoo.com/quote/UNP/history>

Market Value Data for MSDCF Shares Outstanding for CSX - End of 2018

Document

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

(X) QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2018

OR

() TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-8022



CSX CORPORATION

(Exact name of registrant as specified in its charter)

<u>Virginia</u> (State or other jurisdiction of incorporation or organization) <u>500 Water Street, 15th Floor, Jacksonville, FL</u> (Address of principal executive offices)	<u>62-1051971</u> (I.R.S. Employer Identification No.) <u>32202</u> (Zip Code) <u>(904) 359-3200</u> (Telephone number, including area code)
---	---

No Change

(Former name, former address and former fiscal year, if changed since last report.)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes (X) No ()

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes (X) No ()

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer", "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (check one)

Large Accelerated Filer (X) Accelerated Filer () Non-accelerated Filer () Smaller Reporting Company () Emerging growth company ()

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ()

Indicate by a check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes () No (X)

There were 844,420,361 shares of common stock outstanding on September 30, 2018 (the latest practicable date that is closest to the filing date).

Market Value Data for MSDCF Shares Outstanding for KSU - End of 2018

Document

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UNITED STATES SECURITIES AND EXCHANGE COMMISSION Washington, D.C. 20549 Form 10-Q

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended September 30, 2018

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number 1-4717

KANSAS CITY SOUTHERN

(Exact name of registrant as specified in its charter)

Delaware
*(State or other jurisdiction of
incorporation or organization)*

**427 West 12th Street,
Kansas City, Missouri**
(Address of principal executive offices)



44-0663509
*(I.R.S. Employer
Identification No.)*

64105
(Zip Code)

816.983.1303
(Registrant's telephone number, including area code)

No Change
(Former name, former address and former fiscal year, if changed since last report.)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

Class

October 12, 2018

<https://www.sec.gov/Archives/edgar/data/54480/00005448018000201/kcs10q09302018.htm>[11/8/2018 2:03:31 PM]

Common Stock, \$0.01 per share par value

101,697,441 Shares

Market Value Data for MSDCF Shares Outstanding for NSC - End of 2018

Document

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549
FORM 10-Q

(X) QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 for the quarterly period ended **SEPTEMBER 30, 2018**

() TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 for the transition period from _____ to _____

Commission file number 1-8339



NORFOLK SOUTHERN CORPORATION
(Exact name of registrant as specified in its charter)

Virginia
(State or other jurisdiction of incorporation)

52-1188014
(IRS Employer Identification No.)

Three Commercial Place
Norfolk, Virginia
(Address of principal executive offices)

23510-2191
(Zip Code)

(757) 629-2680
(Registrant's telephone number, including area code)

No Change
(Former name, former address and former fiscal year, if changed since last report)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes ☐ No ☒

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

<u>Class</u>	<u>Outstanding at September 30, 2018</u>
Common Stock (\$1.00 par value per share)	272,346,940 (excluding 20,300,777 shares held by the registrant's consolidated subsidiaries)

Market Value Data for MSDCF Shares Outstanding for UNP - End of 2018

09302018 Q3

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UNITED STATES SECURITIES AND EXCHANGE COMMISSION WASHINGTON, D.C. 20549

FORM 10-Q

(Mark One)

? QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2018
OR

? TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-6075

UNION PACIFIC CORPORATION

(Exact name of registrant as specified in its charter)

UTAH

(State or other jurisdiction of
incorporation or organization)

13-2626465

(I.R.S. Employer
Identification No.)

1400 DOUGLAS STREET, OMAHA, NEBRASKA
(Address of principal executive offices)

68179
(Zip Code)

(402) 544-5000

(Registrant's telephone number, including area code)

? Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. ? Yes ? No

? Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). ? Yes ? No

? Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ?	Accelerated filer ?	Non- accelerated filer ?	Smaller reporting company ?	Emerging growth company ?
---------------------------------	------------------------	--------------------------------	--------------------------------	---------------------------------

? Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). ? Yes ? No

? If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ?

? As of October 19, 2018, there were 736,790,118 shares of the Registrant's Common Stock outstanding.

2018 Cost of Equity Using STB's MSDCF

Company Year	CSX 2018		KSU 2018		NSC 2018		UNP 2018	
<i>Inputs</i>								
Initial Cash Flow	\$1,555.28		\$208.45		\$1,378.60		\$4,066.82	
Input for Terminal C.F.	\$2,225.84		\$551.31		\$2,080.73		\$5,154.01	
Stage One Growth	27.430%		14.700%		17.400%		19.990%	
Stage Two Growth	19.880%		19.880%		19.880%		19.880%	
Stage Three Growth*	5.000%		5.000%		5.000%		5.000%	
Year	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.
1	\$1,982	\$1,684	\$239	\$208	\$1,618	\$1,396	\$4,880	\$4,159
2	2,526	1,824	274	209	1,900	1,413	5,855	4,254
3	3,218	1,976	315	209	2,231	1,431	7,026	4,350
4	4,101	2,140	361	209	2,619	1,448	8,430	4,449
5	5,226	2,318	414	209	3,075	1,466	10,115	4,551
6	6,265	2,362	496	218	3,686	1,516	12,126	4,650
7	7,510	2,406	595	228	4,418	1,567	14,537	4,751
8	9,003	2,452	713	238	5,297	1,620	17,427	4,855
9	10,793	2,498	855	249	6,350	1,675	20,891	4,960
10	12,939	2,545	1,025	261	7,612	1,732	25,045	5,068
Terminal	153,615	30,217	29,421	7,484	110,087	25,045	270,439	54,731
Sum of Pres. Values	\$52,421.62		\$9,721.26		\$40,310.07		\$100,778.15	
Market Value (input)	\$52,421.62		\$9,721.26		\$40,310.07		\$100,778.15	
Cost of Equity	17.66%		14.67%		15.96%		17.32%	
Prev. Yr. Cost of Equity	11.75%		11.28%		11.87%		12.60%	

Preferred Stock

Cost of Preferred Equity Capital

Step 1: Calculate Average Stock Price and Annual Dividend

		Stock Price			Dividend	
		High	Low	Avg.		
KSU	\$25 par pref., 4%, noncummm.	Q1	\$27.00	\$26.26	\$26.628	\$0.25
		Q2	\$27.15	\$25.27	\$26.209	\$0.25
		Q3	\$33.12	\$25.36	\$29.240	\$0.25
		Q4	\$27.97	\$24.11	\$26.040	\$0.25
		Year			\$27.029	\$1.00

Step 2: Calculate Cost of Preferred Equity Capital Using Dividend Yield method

		Annual Dividend	Average Price	Yield
KSU	\$25 par preferred, 4%, noncumulative	\$1.00	\$27.029	3.700%

Cost of Preferred Equity → **3.70%**

Previous Year Cost of Preferred Equity 3.58%

Market Value of Preferred Equity

		Outstanding Shares	Average Price	Market Value
KSU	\$25 par preferred, 4%, noncumulative	228,395	\$27.029	\$6,173,363

Sources: Kansas City Southern Form 10-K for 2018, Part II Item 5 and Balance Sheet
Yahoo Finance (stock prices)

Yahoo Finance Data Issue Summary

The daily stock prices downloaded from Yahoo Finance for CSX, KSU, NSC, and UNP matched those downloaded from Bloomberg, as did the weekly version downloaded from Yahoo Finance. The dividend-adjusted stock prices did not match. The causes of the problems appear to be related to dividends.

Yahoo has an extra (5th) dividend in its database for NSC in 2015 (see page 3 herein). This caused the Yahoo calculation difference from Bloomberg, and it can be remedied by simply removing the dividend and recalculating the adjusted prices (see page 5 herein).

Yahoo has a dividend for UNP at the beginning of 2014 that has not been adjusted for a stock split, yet their stock data has been adjusted for the split (see page 4 herein). This caused the Yahoo calculation difference, and it can be remedied by simply correcting the dividend (divided by two) and recalculating the adjusted prices (see page 6 herein).

AAR Data Check Procedure

- (1) AAR discovered that it could not download the Yahoo Finance data, so data from Bloomberg was downloaded. The data had stock daily stock prices and daily dividend-adjusted stock prices. The data set was from 12/20/2013 through 3/17/2019. A spreadsheet was used to find the end of each week, and the last trading day of each week was used to form the regression data set.
- (2) AAR discovered that Yahoo Finance data could be downloaded using the Google Chrome web browser instead of Microsoft Internet Explorer. The weekly data set was downloaded and had **numerous differences from Bloomberg for the dividend-adjusted prices**.
- (3) AAR downloaded Yahoo Finance daily stock data, and used a spreadsheet to select the end of each week for the regression data set. This data set **essentially matched** Bloomberg **except for NSC and UNP where the dividends** in the Yahoo data caused differences.
- (4) AAR researched NSC and UNP dividends, and used a corrected Yahoo dividend set that was confirmed by Bloomberg and 10-K reports where differences existed. AAR replicated the Yahoo Finance daily stock data dividend-adjusted stock prices (data set 3), and then created a **corrected data set** using the correct dividends. A spreadsheet was used to select the last trading day of each week.

Data set 4 was used for the beta calculation, and data set 1 was used as a check. Data set 4 contains stock price data downloaded from Yahoo Finance, where a spreadsheet selected the last trading day of each week. Dividend-adjusted stock prices from Yahoo Finance were also used with the following corrections: NSC week 0 through week 68, and UNP weeks 0 through 7. Further details are in the work papers.

Yahoo Finance Data Issue

How to Calculate Dividend-Adjusted Stock Prices

The screenshot shows the StockCharts website interface. At the top, there's a navigation bar with 'StockCharts' logo, a search bar, and links for 'Charts & Tools', 'Articles', 'StockCharts TV', 'ChartSchool', and 'Your Dashboard'. Below this, a large banner reads 'Historical Price Data is Adjusted for Splits, Dividends and Distributions'. The main content area contains the following text:

We adjust our historical price data to remove gaps caused by stock splits, dividends, and distributions. That may cause our charts to look different from other services that do not perform the same adjustments.

For example, if a stock splits 2-for-1, the price is suddenly half of what it used to be, creating a large gap down on the chart. If you were unaware of the split, the chart would give you the impression that something bearish happened to the underlying company. In addition, most of the technical indicators on that chart would give sell signals because of the big drop in prices. Even though such a split is generally considered a neutral event, an unadjusted chart would contain lots of bearish signals.

In order to prevent these kinds of misleading signals from appearing on our charts, we adjust all the historical data prior to the event. In the case of a 2-for-1 split, we divide all of the historical prices for the stock by 2 and multiply all of the historical volume by 2, so that the bars prior to the split match up smoothly with the bars that appear after the split.

In addition to performing adjustments that remove large gaps caused by splits, we also adjust our historical data to remove smaller gaps caused by dividends and distributions. By making these additional adjustments, we ensure that all price movements on our charts are caused by pure market forces - i.e., the forces that Technical Analysis attempts to identify.

On the right side of the article, there's a sidebar with an 'Outline' section listing: 'Historical Price Data is Adjusted for Splits, Dividends and Distributions', 'Dividend Adjustment Calculation Details', and 'Split Adjustment Calculation Details'. Below that is a 'Key Support Links' section with links for 'FAQ', 'Account Settings', 'Troubleshooting', and 'Policies'. At the bottom is a 'Still Need Help?' section with a note: 'If you searched for an answer in the forums and you still need help, send us a message'.

Dividend Adjustment Calculation Details

Historical prices are adjusted by a factor that is calculated when the stock begins trading ex-dividend. The amount of the dividend is subtracted from the prior day's price, and the result is divided by the prior day's price. Historical prices are then multiplied by this factor.

Example: A stock closes at \$40.00 on Monday. Tuesday it begins trading ex-dividend based on a \$2.00 dividend. If the stock opens unchanged, it will be trading at \$38.00. Unless we adjust the prior prices, the chart will show a misleading \$2.00 gap.

To calculate the adjustment factor we subtract the 2.00 dividend from Monday's closing price of 40.00 (= 38.00). Then we divide 38.00 by 40.00 to determine the dividend adjustment in percentage terms. The result is 0.95.

We then multiply all historical prices prior to the dividend by 0.95. This adjusts historical prices proportionately so that they stay rationally aligned with current prices.

Yahoo Finance Data Issue NSC Dividends

Correct	
Date	Dividends
2/5/2014	0.54
4/30/2014	0.54
7/30/2014	0.57
11/5/2014	0.57
2/4/2015	0.59
5/6/2015	0.59
8/5/2015	0.59
11/4/2015	0.59
2/3/2016	0.59
5/4/2016	0.59
8/4/2016	0.59
11/2/2016	0.59
2/1/2017	0.61
5/3/2017	0.61
8/3/2017	0.61
11/2/2017	0.61
2/1/2018	0.72
5/3/2018	0.72
8/3/2018	0.80
11/1/2018	0.80
2/1/2019	0.86

Yahoo lists 5 dividends for 2015 while the NSC 10-K lists the normal 4.

Yahoo Finance	
Date	Dividends
2/5/2014	0.54
4/30/2014	0.54
7/30/2014	0.57
11/5/2014	0.57
2/4/2015	0.59
4/29/2015	0.59
5/6/2015	0.59
8/5/2015	0.59
11/4/2015	0.59
2/3/2016	0.59
5/4/2016	0.59
8/4/2016	0.59
1/2/2017	0.59
2/1/2017	0.61
5/3/2017	0.61
8/3/2017	0.61
1/2/2018	0.61
2/1/2018	0.72
5/3/2018	0.72
8/3/2018	0.80
11/1/2018	0.80
2/1/2019	0.86

BSE:10				
NSC 10-K (2018) Corporate Equity, Related Financial Metrics, and Other Payables of Equity Securities				
Item 5. Market for Registrant's Common Equity, Related Stockholder Matters, and Recent Purchase of Equity Securities				
STOCK PRICE AND DIVIDEND INFORMATION				
Company/stock is listed by BSE:10 stockholders of record as of December 31, 2018 and is listed on the New York Stock Exchange under the symbol "NSC". The following table shows the high and low stock prices as reported by Bloomberg L.P. on its internet-based service and dividends per share by quarter for 2018 and 2019.				
2018	Quarter			
	1st	2nd	3rd	4th
Market Price				
High	\$ 111.81	\$ 108.47	\$ 88.64	\$ 77.07
Low	\$ 98.54	\$ 97.24	\$ 75.75	\$ 72.19
Dividends per share	\$ 0.59	\$ 0.59	\$ 0.59	\$ 0.59

Bloomberg does not list a 4/29/2015 dividend, and lists four dividends for 2015.



NSC Check

March 19, 2019

Yahoo Finance Data Issue UNP Dividends

Correct	
Date	Dividends
2/26/2014	0.455
6/12/2014	0.455
8/27/2014	0.500
11/28/2014	0.500
2/25/2015	0.550
5/27/2015	0.550
8/27/2015	0.550
11/25/2015	0.550
2/25/2016	0.550
5/26/2016	0.550
8/29/2016	0.550
11/28/2016	0.605
2/24/2017	0.605
5/26/2017	0.605
8/29/2017	0.605
11/29/2017	0.665
2/27/2018	0.730
5/30/2018	0.730
8/30/2018	0.800
11/29/2018	0.800
2/27/2019	0.880

Yahoo Finance	
Date	Dividends
2/26/2014	0.910
6/12/2014	0.455
8/27/2014	0.500
11/28/2014	0.500
2/25/2015	0.550
5/27/2015	0.550
8/27/2015	0.550
11/25/2015	0.550
2/25/2016	0.550
5/26/2016	0.550
8/29/2016	0.550
11/28/2016	0.605
2/24/2017	0.605
5/26/2017	0.605
8/29/2017	0.605
11/29/2017	0.665
2/27/2018	0.730
5/30/2018	0.730
8/30/2018	0.800
11/29/2018	0.800
2/27/2019	0.880

Yahoo Finance says 0.910 for the 2/26/2014 UNP dividend, while Bloomberg says 0.455 (screen shot below with dark background). It appears that Yahoo has not adjusted this for the stock split, even though the stock prices are adjusted for the split. UNP 10-K says 0.455.

PART II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters, and Investor Purchases of Equity Securities.

Our common stock is traded on the New York Stock Exchange (NYSE) under the symbol UNP. The following table presents the dividends declared and the high and low prices of our common stock for each of the indicated quarters. All amounts are retroactively adjusted to reflect the June 8, 2014 stock split.

Quarter	Q1	Q2	Q3	Q4
Dividends	\$ 0.455	\$ 0.455	\$ 0.550	\$ 0.550
High	\$1.24	\$1.28	\$1.28	\$1.31
Low	\$1.49	\$1.25	\$1.19	\$1.17



UNP Check

March 19, 2019

Yahoo Finance Data Issue NSC Correction

NSC Data Yahoo Finance

Yahoo Data		
Date	Close	Adj Close
4/30/2015	100.85	91.80154
4/29/2015	103.18	93.92251
4/28/2015	104.37	94.46866
4/27/2015	104.5	94.58632
4/24/2015	105.29	95.30138
4/23/2015	106.21	96.13409
4/22/2015	104.97	95.01173
4/21/2015	102.41	92.6946
4/20/2015	103.04	93.26483
4/17/2015	100.65	91.10156
4/16/2015	100.27	90.75761
4/15/2015	100.74	91.18303
4/14/2015	100.49	90.95673
4/13/2015	104.87	94.92122
4/10/2015	106.35	96.26081
4/9/2015	105.77	95.73584
4/8/2015	104.32	94.42341
4/7/2015	104.46	94.55011
4/6/2015	104.43	94.52296
4/2/2015	104.15	94.26952
4/1/2015	102.96	93.19242
3/31/2015	102.92	93.15623
3/30/2015	104	94.13375
3/27/2015	103.62	93.78981
3/26/2015	103.91	94.05229
3/25/2015	104.05	94.17902
3/24/2015	106.07	96.00739
3/23/2015	106.56	96.45091
3/20/2015	110.43	99.95377
3/19/2015	110.31	99.84515
3/18/2015	111.13	100.5873
3/17/2015	109.88	99.45595
3/16/2015	110.58	100.0895
3/13/2015	108.65	98.34264
3/12/2015	109.23	98.8676
3/11/2015	108.22	97.95342
3/10/2015	107.58	97.37414
3/9/2015	109.03	98.68657
3/6/2015	108.21	97.94437

CheckNSCcalc

Replicate Yahoo Calculation

Dividend	Factor	Adj Close	Diff
0	0.910278	91.80153	0.00
0.59	0.910278	93.92248	0.00
0	0.905132	94.46865	0.00
0	0.905132	94.58632	0.00
0	0.905132	95.30137	0.00
0	0.905132	96.13409	0.00
0	0.905132	95.01173	0.00
0	0.905132	92.69459	0.00
0	0.905132	93.26482	0.00
0	0.905132	91.10156	0.00
0	0.905132	90.7576	0.00
0	0.905132	91.18302	0.00
0	0.905132	90.95673	0.00
0	0.905132	94.92122	0.00
0	0.905132	96.26081	0.00
0	0.905132	95.73583	0.00
0	0.905132	94.42339	0.00
0	0.905132	94.55011	0.00
0	0.905132	94.52296	0.00
0	0.905132	94.26952	0.00
0	0.905132	93.19241	0.00
0	0.905132	93.15621	0.00
0	0.905132	94.13375	0.00
0	0.905132	93.7898	0.00
0	0.905132	94.05229	0.00
0	0.905132	94.17901	0.00
0	0.905132	96.00737	0.00
0	0.905132	96.45089	0.00
0	0.905132	99.95375	0.00
0	0.905132	99.84513	0.00
0	0.905132	100.5873	0.00
0	0.905132	99.45592	0.00
0	0.905132	100.0895	0.00
0	0.905132	98.34262	0.00
0	0.905132	98.86759	0.00
0	0.905132	97.95341	0.00
0	0.905132	97.37413	0.00
0	0.905132	98.68656	0.00
0	0.905132	97.94436	0.00

Yahoo
extra
5th
dividend
that did
not
really
happen

Corrected Yahoo Calculation

Dividend	Factor	Adj Close	Bloom
0	0.910278	91.80153	0.000
0	0.910278	93.92248	0.000
0	0.910278	95.00572	0.000
0	0.910278	95.12405	0.000
0	0.910278	95.84317	0.000
0	0.910278	96.68062	0.000
0	0.910278	95.55188	0.000
0	0.910278	93.22157	0.000
0	0.910278	93.79504	0.000
0	0.910278	91.61948	0.000
0	0.910278	91.27357	0.000
0	0.910278	91.7014	0.000
0	0.910278	91.47383	0.000
0	0.910278	95.46085	0.000
0	0.910278	96.80806	0.000
0	0.910278	96.2801	0.000
0	0.910278	94.9602	0.000
0	0.910278	95.08764	0.000
0	0.910278	95.06033	0.000
0	0.910278	94.80545	0.000
0	0.910278	93.72222	0.000
0	0.910278	93.68581	0.000
0	0.910278	94.66891	0.000
0	0.910278	94.32301	0.000
0	0.910278	94.58699	0.000
0	0.910278	94.71443	0.000
0	0.910278	96.55319	0.000
0	0.910278	96.99922	0.000
0	0.910278	100.522	0.000
0	0.910278	100.4128	0.000
0	0.910278	101.1592	0.000
0	0.910278	100.0213	0.000
0	0.910278	100.6585	0.000
0	0.910278	98.9017	0.000
0	0.910278	99.42967	0.000
0	0.910278	98.51028	0.000
0	0.910278	97.92771	0.000
0	0.910278	99.24761	0.000
0	0.910278	98.50118	0.000

Day of Week

Thursday, April 30, 2015
Wednesday, April 29, 2015
Tuesday, April 28, 2015
Monday, April 27, 2015
Friday, April 24, 2015
Thursday, April 23, 2015
Wednesday, April 22, 2015
Tuesday, April 21, 2015
Monday, April 20, 2015
Friday, April 17, 2015
Thursday, April 16, 2015
Wednesday, April 15, 2015
Tuesday, April 14, 2015
Monday, April 13, 2015
Friday, April 10, 2015
Thursday, April 9, 2015
Wednesday, April 8, 2015
Tuesday, April 7, 2015
Monday, April 6, 2015
Thursday, April 2, 2015
Wednesday, April 1, 2015
Tuesday, March 31, 2015
Monday, March 30, 2015
Friday, March 27, 2015
Thursday, March 26, 2015
Wednesday, March 25, 2015
Tuesday, March 24, 2015
Monday, March 23, 2015
Friday, March 20, 2015
Thursday, March 19, 2015
Wednesday, March 18, 2015
Tuesday, March 17, 2015
Monday, March 16, 2015
Friday, March 13, 2015
Thursday, March 12, 2015
Wednesday, March 11, 2015
Tuesday, March 10, 2015
Monday, March 9, 2015
Friday, March 6, 2015

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Yahoo Finance Data Issue UNP Correction

UNP Data Yahoo Finance

Yahoo Data		
Date	Close	Adj Close
3/31/2014	93.83	84.03126
3/28/2014	92.375	82.72821
3/27/2014	91.655	82.08339
3/26/2014	92.155	82.53117
3/25/2014	93.49	83.72677
3/24/2014	94	84.1835
3/21/2014	93.665	83.88347
3/20/2014	94.365	84.51038
3/19/2014	93.425	83.66855
3/18/2014	94.7	84.81039
3/17/2014	93.685	83.90138
3/14/2014	92.57	82.90282
3/13/2014	92.93	83.22524
3/12/2014	93.77	83.97751
3/11/2014	92.885	83.18494
3/10/2014	93.11	83.38644
3/7/2014	93.785	83.99095
3/6/2014	92.93	83.22524
3/5/2014	92.17	82.54462
3/4/2014	91.925	82.32518
3/3/2014	89.755	80.3818
2/28/2014	90.19	80.77136
2/27/2014	89.25	79.92955
2/26/2014	88.605	79.35191
2/25/2014	89.35	79.20414
2/24/2014	89.805	79.60746
2/21/2014	89.56	79.3903
2/20/2014	88.935	78.83625
2/19/2014	87.935	77.94982
2/18/2014	89.15	79.02685
2/14/2014	90.07	79.84238
2/13/2014	89.32	79.17754
2/12/2014	89.425	79.27063
2/11/2014	88.85	78.7609
2/10/2014	87.39	77.46671
2/7/2014	88.45	78.40633
2/6/2014	87.56	77.6174
2/5/2014	86.315	76.51375

CheckUNPcalc

Replicate Yahoo Calculation

Dividend	Factor	Adj Close	Diff
0	0.895569	84.03126	0.00
0	0.895569	82.72821	0.00
0	0.895569	82.0834	0.00
0	0.895569	82.53118	0.00
0	0.895569	83.72676	0.00
0	0.895569	84.18351	0.00
0	0.895569	83.88349	0.00
0	0.895569	84.51039	0.00
0	0.895569	83.66856	0.00
0	0.895569	84.8104	0.00
0	0.895569	83.9014	0.00
0	0.895569	82.90284	0.00
0	0.895569	83.22525	0.00
0	0.895569	83.97752	0.00
0	0.895569	83.18495	0.00
0	0.895569	83.38645	0.00
0	0.895569	83.99096	0.00
0	0.895569	83.22525	0.00
0	0.895569	82.54461	0.00
0	0.895569	82.3252	0.00
0	0.895569	80.38181	0.00
0	0.895569	80.77139	0.00
0	0.895569	79.92955	0.00
0.91	0.895569	79.35191	0.00
0	0.886448	79.20414	0.00
0	0.886448	79.60748	0.00
0	0.886448	79.39029	0.00
0	0.886448	78.83626	0.00
0	0.886448	77.94982	0.00
0	0.886448	79.02685	0.00
0	0.886448	79.84238	0.00
0	0.886448	79.17755	0.00
0	0.886448	79.27063	0.00
0	0.886448	78.76092	0.00
0	0.886448	77.4667	0.00
0	0.886448	78.40634	0.00
0	0.886448	77.6174	0.00
0	0.886448	76.51377	0.00

Corrected Yahoo Calculation

Dividend	Factor	Adj Close	Diff from
0	0.895569	84.03126	-0.004
0	0.895569	82.72821	-0.004
0	0.895569	82.0834	-0.004
0	0.895569	82.53118	-0.004
0	0.895569	83.72676	-0.004
0	0.895569	84.18351	-0.004
0	0.895569	83.88349	-0.004
0	0.895569	84.51039	-0.004
0	0.895569	83.66856	-0.004
0	0.895569	84.8104	-0.004
0	0.895569	83.9014	-0.004
0	0.895569	82.90284	-0.004
0	0.895569	83.22525	-0.004
0	0.895569	83.97752	-0.004
0	0.895569	83.18495	-0.004
0	0.895569	83.38645	-0.004
0	0.895569	83.99096	-0.004
0	0.895569	83.22525	-0.004
0	0.895569	82.54461	-0.004
0	0.895569	82.3252	-0.004
0	0.895569	80.38181	-0.003
0	0.895569	80.77139	-0.003
0	0.895569	79.92955	-0.003
0.455	0.895569	79.35191	-0.003
0	0.891009	79.61162	-0.003
0	0.891009	80.01703	-0.003
0	0.891009	79.79874	-0.003
0	0.891009	79.24186	-0.003
0	0.891009	78.35085	-0.003
0	0.891009	79.43343	-0.003
0	0.891009	80.25315	-0.003
0	0.891009	79.5849	-0.003
0	0.891009	79.67845	-0.003
0	0.891009	79.16812	-0.003
0	0.891009	77.86525	-0.003
0	0.891009	78.80972	-0.003
0	0.891009	78.01672	-0.003
0	0.891009	76.90742	-0.003

Day of Week
Monday, March 31, 2014
Friday, March 28, 2014
Thursday, March 27, 2014
Wednesday, March 26, 2014
Tuesday, March 25, 2014
Monday, March 24, 2014
Friday, March 21, 2014
Thursday, March 20, 2014
Wednesday, March 19, 2014
Tuesday, March 18, 2014
Monday, March 17, 2014
Friday, March 14, 2014
Thursday, March 13, 2014
Wednesday, March 12, 2014
Tuesday, March 11, 2014
Monday, March 10, 2014
Friday, March 7, 2014
Thursday, March 6, 2014
Wednesday, March 5, 2014
Tuesday, March 4, 2014
Monday, March 3, 2014
Friday, February 28, 2014
Thursday, February 27, 2014
Wednesday, February 26, 2014
Tuesday, February 25, 2014
Monday, February 24, 2014
Friday, February 21, 2014
Thursday, February 20, 2014
Wednesday, February 19, 2014
Tuesday, February 18, 2014
Friday, February 14, 2014
Thursday, February 13, 2014
Wednesday, February 12, 2014
Tuesday, February 11, 2014
Monday, February 10, 2014
Friday, February 7, 2014
Thursday, February 6, 2014
Wednesday, February 5, 2014

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